C21.5: 973/3

Vol. 973 Number 3

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

August 15, 1978

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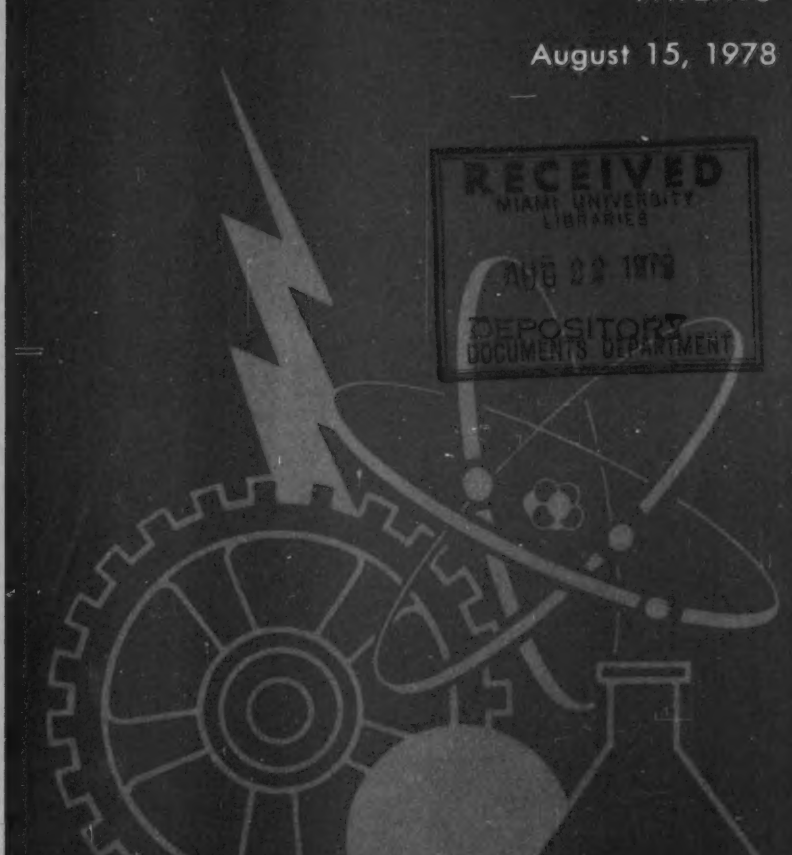

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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

August 15, 1978 Volume 973 Number 3

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT including the amounts of the fees thereunder and the States that may be designated in International applications consult the Notice entitled "Patent Cooperation Treaty (PCT) Implementation: Information for Prospective Applicants" appearing in the OFFICIAL GAZETTE of May 16, 1978.

LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks.

May 2, 1978.

Board of Appeals Decisions Rendered in the Month of June 1978

Affirmed	214
Affirmed in Part	19
Reversed	70
Total	303

Registration to Practice

The following list contains the names of persons applying for registrations to practice before the United States Patent and Trademark Office. Information tending to affect the eligibility of said applicants on moral, ethical, or other grounds, should be furnished the Commissioner of Patents and Trademarks on or before October 6, 1978.

Ball, William E., 8352 Wagon Wheel Rd., Alexandria, Va. 22309
Benman, William J., Jr., 2018 Sherman, Evanston, Ill. 60201
Benson, Joel W., 2109 N. Brandywine St., Arlington, Va. 22207
Gwinnel, Harry J., 6803 Bellamy Ave., Springfield, Va. 22152
Hagen, Timothy W., 2590 Timber Grove, Annapolis, Md. 21401
Kopchinsky, Grigory, 360 Lexington Ave., New York, N.Y. 10017
McClung, Guy, Bank of the Southwest Bldg., Houston, Tex. 77002
Mitchard, Leonard C., 4106 Maryland Ave., Bethesda, Md. 20016
Parada, Nikolay, 3045 Ocean Pkwy., #4G, Brooklyn, N.Y. 11235
Pecora, Robin J., 204 E. Preston St., Baltimore, Md. 21202
Sadowski, Jeffrey A., 25156 Fortuna, Roseville, Mich. 48066
Samanta, Mrinmay, P.O. Box 2322, Washington, D.C. 20013
Schulte, Timothy R., 705 A. Lexington Ave., China Lake, Calif. 93555
Slade, Elizabeth O., Phillips Petroleum Co., 410 TRW Bldg., Bartlesville, Okla. 74003
VonBodungen, Raymond C., 1009 Opelousas Ave., New Orleans, La. 70014
Wilson, Harold H., 1500 Elm St., San Carlos, Calif. 94070

July 20, 1978.

LUTRELLE F. PARKER,
Chairman, Committee on Enrollment.

Commercial Success and Other Considerations Bearing on Obviousness

In order to clarify Office practice relative to considerations of commercial success and other items bearing on obviousness, the following changes are being made in the Manual of Patent Examining Procedure.

In section 716, subsection 4, change the sub-title and first paragraph to read as follows:

4. *Commercial Success and Other Considerations Bearing on Obviousness*

Affidavits or declarations submitting evidence of commercial success, long-felt but unsolved needs, failure of others, etc., must be considered by the Examiner in determining the issue of obviousness of claims for patent-ability under 35 U.S.C. 103. Such evidence might be utilized to give light to circumstances surrounding the origin of the subject matter sought to be patented. As indicia of obviousness or unobviousness, such evidence may have relevancy. *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966); *In re Palmer*, 172 USPQ 126, 451 F.2d 1100 (CCPA 1971); *In re Fielder and Underwood*, 176 USPQ 300, 471 F.2d 640 (CCPA 1973). The *Graham* v. *John Deere* pronouncements on the relevance of commercial success, etc. to a determination of obviousness were not negated in *Sakraida* v. *Ag Pro*, 425 U.S. 273, 189 USPQ 449 (1976) or *Andersons Black Rock, Inc.* v. *Pavement Salvage Co., Inc.*, 396 U.S. 57, 163 USPQ 673 (1969), where reliance was placed upon *A & P Tea Co.* v. *Supermarket Corp.*, 340 U.S. 147 87 USPQ 303 (1950). See *Dann* v. *Johnston*, 425 U.S. 219, 189 USPQ 257 (1976), at 261, footnote 4.

The weight attached to evidence of commercial success, etc. by the Examiner will depend upon its materiality to the issue of obviousness and the amount and nature of the evidence. Note the great reliance apparently placed on this type of evidence by the Supreme Court in upholding the patent in *United States* v. *Adams*, 383 U.S. 39, 148 USPQ 479 (1966).

Evidence of commercial success, etc. must be commensurate in scope with the scope of the claims [*In re Tiffin*, 448 F.2d, 791, 171 USPQ 294 (1971)]. Further in considering evidence of commercial success, care should be taken to evaluate, to the extent possible from the evidence submitted, whether the commercial success alleged is directly derived from the invention claimed, in a marketplace where the consumer is free to choose on the basis of objective principles, and that such success is *not* the result of heavy promotion or advertising, shift in advertising consumption by purchasers normally tied to applicant or assignee, or other business events extraneous to the merits of the claimed invention, etc. [*In re Mageli et al*, 176 USPQ 305, (CCPA 1973)]; [*In re Noznick et al*, 178 USPQ 43, (CCPA 1973)].

Similarly in considering evidence of longfelt but unsolved needs and failure of others, care should be taken to determine whether such failures were due to lack of interest or appreciation of an invention's potential or marketability rather than want of technical know-how [*Scully Signal Co.* v. *Electronics Corp. of America*, 196 USPQ 657 (1st Cir. 1977)].

In section 716, subsection 4, add the following as the last paragraph:

If, after evaluating the evidence, the examiner is still not convinced that the claimed invention is patentable, his action should include a simple statement to that effect, identifying the reason(s) (e.g., evidence of commercial success not convincing, the commercial success not related to the technology, etc.).

July 10, 1978.

RENE D. TEGTMEYER,
Assistant Commissioner for Patents.

Delay in Printing and Distribution of Patents

The printing and distribution of patents that have been issued, as indicated by their publication in the OFFICIAL GAZETTE, have been subject to serious delays since earlier this year. No delays have occurred in the publication of the OFFICIAL GAZETTE. Unfortunately the patent printing delays are expected to continue for several more months. These delays do not affect the availability to the public of the patented files for granted patents, which can be reviewed from the date of grant of the patent.

The delays stem from difficulties encountered in keeping up with the printing workload by a contractor for the U.S. Government Printing Office. That Office handles all of the printing and distribution of printed patents. The Patent and Trademark Office has been urging the elimination of this delay for some months as earlier indicated in a notice dated April 18, 1978 (970 O.G. 10). As a result of recent meetings with the Patent and Trademark Office, the Public Printer is taking additional steps to eliminate the delays. It will, however, still take at least three months to catch up with the printing backlog.

The Patent and Trademark Office has understandably received numerous complaints about the delays. The serious difficulties and inconveniences that the delays are causing are sincerely regretted.

July 25, 1978.

DONALD W. BANNER,
Commissioner of Patents and Trademarks.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,368,837, Re. S.N. 905,818, Filed May 15, 1978, Cl. 294/74, FABRIC LOAD LIFTING SLING, Roy Norton, Owner of Record: *M.H.S. Ltd. d.b.a. Wear Flex Slings, Chicago, Ill.,* Attorney or Agent: Ira Milton Jones, Ex. Gp.: 313

3,393,117, Re. S.N. 915,946, Filed Jun. 15, 1978, Cl. 428/236, COPPER-CLAD GLASS REINFORCED THERMOSET RESIN PANEL, Fred U. Zolg, et al., Owner of Record: *Cincinnati Milacron Inc., Cincinnati, Ohio,* Attorney or Agent: Jack J. Earl, et al., Ex. Gp.: 164

3,487,800, Re. S.N. 910,564, Filed May 30, 1978, Cl. 114/39, WIND-PROPELLED APPARATUS, Henry Hoyle Schweitzer, et al., Owner of Record: *Inventor,* Attorney or Agent: Billy A. Robbins, et al., Ex. Gp.: 315

3,500,509, Re. S.N. 917,392, Filed Jun. 19, 1978, Cl. 24/202, REINFORCED BUTTONHOLE, James R. Moden, Owner of Record: *AMH Corporation, Barrington, R.I.,* Attorney or Agent: Elliot A. Salter, et al., Ex. Gp.: 351

3,570,014, Re. S.N. 915,451, Filed Jun. 14, 1978, Cl. 3/1, STENT FOR HEART VALVE, Warren D. Hancock, Owner of Record: *Hancock Laboratories Inc., Anaheim, Calif.,* Attorney or Agent: Richard F. Carr, et al., Ex. Gp.: 337

3,643,430, Re. S.N. 912,891, Filed Jun. 5, 1978, Cl. 39/65, SMOKE REDUCTION COMBUSTION CHAMBER, John M. G. Emory Jr., et al., Owner of Record: *United Aircraft Corporation, East Hartford, Conn.,* Attorney or Agent: Norman Friedland, et al., Ex. Gp.: 343

3,797,218, Re. S.N. 903,383, Filed May 5, 1978, Cl. 57/58.89, METHOD AND APPARATUS FOR SPINNING SILVER, Hans Landwehrkamp, et al., Owner of Record: *Schubert & Salzer Maschinenfabrik Aktiengesellschaft, Ingolstadt, West Germany,* Attorney or Agent: Ralph Bailey, et al., Ex. Gp.: 244

3,801,130, Re. S.N. 867,795, Filed Jan. 9, 1978, Cl. 280/240, BICYCLE WITH A PIVOTABLE REAR WHEEL, Ralph A. Belden, Owner of Record: *Ralph A. Belden, Philip P. Brasscur and Eugene V. H. Brasscur, all of Spokane, Wash.,* Attorney or Agent: Richard J. St. John, et al., Ex. Gp.: 316

3,823,522, Re. S.N. 915,445, Filed Jun. 14, 1978, Cl. 52/641, HINGED CONNECTOR PLATE, John Calvin Jureit, et al., Owner of Record: *Automated Building Components, Inc., Miami, Fla.,* Attorney or Agent: Robert E. LeBlanc, et al., Ex. Gp.: 354

3,878,419, Re. S.N. 916,278, Filed Jun. 16, 1978, Cl. 310/156, PRECISION BASE MERCURY VAPOR LAMP, Carlo F. LaFiandra, Owner of Record: *Perkin-Elmer, Norwalk, Conn.,* Attorney or Agent: John B. Young, et al., Ex. Gp.: 212

3,940,606, Re. S.N. 915,683, Filed Jun. 14, 1978, Cl. 362/263, HIGH INTENSITY SPOTLIGHT, Thomas M. Lemons, Owner of Record: *Starlight Associates, Salem, Mass.,* Attorney or Agent: Stanley J. Yavner, Ex. Gp.: 212

3,948,515, Re. S.N. 893,350, Filed Apr. 4, 1978, Cl. 272/69, ROUND TRAMPOLINE, Harold L. McNeil, Owner of Record: *Temple Baptist Church, Tallahassee, Fla.,* Attorney or Agent: Harvey B. Jacobson, Ex. Gp.: 334

3,973,839, Re. S.N. 907,838, Filed May 19, 1978, Cl. 352/5, SPECIAL EFFECTS GENERATION AND CONTROL SYSTEM FOR MOTION PICTURES, Richard J. Stumpf, et al., Owner of Record: *MCA Systems, Inc., Universal City, Calif.,* Attorney or Agent: Gilbert G. Kovelman, Ex. Gp.: 211

3,984,801, Re. S.N. 914,464, Filed Jun. 12, 1978, Cl. 337/252, REJECTION-TYPE FUSE CLIP, Stephen A. Mrenna, et al., Owner of Record: *Westinghouse Electric Corporation, Pittsburgh, Pa.,* Attorney or Agent: F. E. Blake, Ex. Gp.: 212

3,984,801, Re. S.N. 914,691, Filed Jun. 12, 1978, Cl. 337/252, REJECTION-TYPE FUSE CLIP, Stephen A. Mrenna, Owner of Record: *Westinghouse Electric Corporation, Pittsburgh, Pa.,* Attorney or Agent: F. E. Blake, Ex. Gp.: 212

3,992,632, Re. S.N. 914,660, Filed Jun. 12, 1978, Cl. 250/423 R, MULTICONFIGURATION IONIZATION SOURCE, William P. Kruger, et al., Owner of Record: *Hewlett-Packard Company, Palo Alto, Calif.,* Attorney or Agent: Michael L. Sherrard, Ex. Gp.: 256

3,995,676, Re. S.N. 914,092, Filed Jun. 9, 1978, Cl. 152/410, RIM CONSTRUCTION AND TOOL APPARATUS FOR SAFE TIRE INFLATION, Robert Casey, Owner of Record: *Caterpillar Tractor Co., Peoria, Ill.,* Attorney or Agent: Ralph E. Walters, Ex. Gp.: 314

4,007,835, Re. S.N. 915,087, Filed Jun. 13, 1978, Cl. 206/411, FUSE AND FOLD FABRIC, William M. Klothe, Owner of Record: *Pellon Corporation, New York, N.Y.,* Attorney or Agent: Arnold Sprung, et al., Ex. Gp.: 241

4,010,395, Re. S.N. 914,091, Filed Jun. 9, 1978, Cl. 313/188, GAS DISCHARGE DISPLAY PANEL WITH CELL-FIRING MEANS HAVING GLOW SPREADING ELECTRODE, George E. Holz, Owner of Record: *Burroughs Corporation, Detroit, Mich.,* Attorney or Agent: Robert A. Green, Ex. Gp.: 252

4,015,111, Re. S.N. 912,074, Filed Jun. 5, 1978, Cl. 362/34, INFLATABLE, CHEMI-LUMINESCENT ASSEMBLY, Donald Spector, Owner of Record: *Inventor,* Attorney or Agent: Michael Ebert, Ex. Gp.: 221

4,020,516, Re. S.N. 871,127, Filed Jan. 19, 1978, Cl. 11/1 A, APPARATUS FOR BINDING LOOSE SHEETS, Albert Gomez, Owner of Record: *Spiral Binding Company, Inc., New York, N.Y.,* Attorney or Agent: John J. Hart, et al., Ex. Gp.: 334

4,042,457, Re. S.N. 912,861, Filed Jun. 5, 1978, Cl. 195/1.8, PREPARATION OF CELL PROLIFERATION AND TISSUE INVASION INHIBITOR AND METHOD OF TREATMENT UTILIZING THE INHIBITOR, Klaus E. Kuettner, et al., Owner of Record: *Rush Presbyterian Saint Luke's Medical Center, Chicago, Ill.,* Attorney or Agent: William E. Anderson, Ex. Gp.: 125

4,043,006, Re. S.N. 905,928, Filed May 15, 1978, Cl. 24/90 R, BUTTON LOCKING DEVICE, Ben Williams, et al., Owner of Record: *Inventors,* Attorney or Agent: Joseph P. House Jr., Ex. Gp.: 351

4,056,091, Re. S.N. 913,849, Filed Jun. 8, 1978, Cl. 126/121, VORTICAL FLOW AEROTHERMODYNAMIC FIREPLACE UNIT, Alexander John Moncrieff Yeates, Owner of Record: *Inventor,* Attorney or Agent: Charles M. Leedom, Jr., et al., Ex. Gp.: 344

4,074,998, Re. S.N. 917,820, Filed Jun. 22, 1978, Cl. 71/66, METHOD OF CONTROLLING AQUATIC WEEDS, William B. Lacefield, Owner of Record: *Eli Lilly and Company, Indianapolis, Ind.,* Attorney or Agent: Arthur R. Whale, et al., Ex. Gp.: 124

PATENT NOTICES

Certificates of Correction for the Week of Aug. 15, 1978

Re.29,607	4,060,593	4,075,690	4,080,880
D.247,393	4,060,701	4,075,883	4,080,917
3,149,476	4,061,402	4,075,931	4,080,950
3,847,280	4,061,701	4,076,414	4,080,997
3,972,839	4,062,664	4,076,520	4,081,097
3,974,615	4,063,098	4,076,626	4,081,124
3,981,625	4,063,955	4,076,725	4,081,148
3,984,834	4,065,035	4,076,731	4,081,337
4,011,091	4,065,047	4,076,809	4,081,407
4,013,668	4,065,646	4,076,849	4,081,411
4,029,698	4,065,656	4,076,873	4,081,562
4,032,438	4,066,494	4,077,073	4,081,738
4,032,855	4,066,531	4,077,106	4,081,960
4,033,093	4,066,534	4,077,180	4,081,970
4,033,990	4,066,575	4,077,319	4,081,971
4,034,037	4,066,689	4,077,478	4,082,093
4,034,544	4,067,556	4,077,608	4,082,238
4,035,780	4,068,689	4,078,148	4,082,245
4,038,005	4,069,637	4,078,315	4,082,297
4,039,346	4,069,707	4,078,723	4,082,430
4,041,062	4,069,918	4,078,845	4,082,480
4,041,063	4,070,167	4,078,879	4,082,520
4,041,105	4,070,351	4,078,882	4,082,751
4,041,605	4,070,904	4,078,920	4,082,791
4,043,958	4,071,084	4,079,207	4,082,856
4,044,134	4,071,334	4,079,235	4,082,961
4,047,201	4,071,647	4,079,298	4,083,010
4,048,658	4,071,831	4,079,432	4,083,382
4,049,868	4,071,984	4,079,552	4,083,503
4,051,229	4,072,665	4,079,605	4,083,751
4,052,017	4,072,989	4,079,785	4,083,779
4,052,540	4,073,169	4,079,987	4,083,849
4,053,599	4,073,352	4,080,131	4,083,861
4,055,359	4,073,625	4,080,239	4,083,888
4,055,641	4,073,846	4,080,249	4,084,285
4,055,689	4,073,980	4,080,338	4,084,318
4,056,364	4,074,127	4,080,397	4,084,362
4,056,848	4,074,152	4,080,534	4,084,496
4,057,297	4,074,292	4,080,552	4,084,595
4,058,491	4,074,798	4,080,634	4,084,821
4,058,784	4,074,895	4,080,718	4,085,874
4,058,786	4,074,946	4,080,725	4,086,005
4,058,810	4,075,124	4,080,767	
4,060,300	4,075,419	4,080,815	

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and possibly foreign licensing in accordance with the licensing policies of the agency-sponsors.

Copies of the patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

Copies of the patent applications can be purchased from the National Technical Information Service (NTIS), Springfield, Va. 22161 for $4.00 ($8.00 outside North American Continent). Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to the public to avoid premature disclosure in the event of an interference before the Patent and Trademark Office. Claims and other technical data will usually be made available to serious prospective licensees by the agency which filed the case.

Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, 1900 Half St. SW.
Washington, D.C. 20324

Patent application 785,481. Method for Fabricating MNOS Memory Circuits. Filed Apr. 7, 1977.

Patent application 787,677. Catadioptric Objective. Filed Apr. 14, 1977.

Patent application 854,449. Microwave Yttrium Iron Garnet Power Limiter Using Electrically Thin Iris. Filed Nov. 23, 1977.

Patent application 855,501. Signal Dynamic Range Enhancement System. Filed Nov. 28, 1977.

Patent application 877,937. Apparatus for, and Method of, Plunge Grinding. Filed Feb. 15, 1978.

Patent 4,074,563. In-situ Measurement Apparatus. Filed Oct. 12, 1976. Patented Feb. 21, 1978. Not available NTIS.

Patent 4,074,568. Fluidic Oscillating Jet for High Frequency Gust Tunnel. Filed May 7, 1976. Patented Feb. 21, 1978. Not available NTIS.

Patent 4,074,908. Double Acting Dynamic Seal With E-Shaped Spring and L-Shaped Seals. Filed Mar. 9, 1977. Patented Feb. 21, 1978. Not available NTIS.

Patent 4,074,930. Coaxial Optical System. Filed Jan. 28, 1976. Patented Feb. 21, 1978. Not available NTIS.

Patent 4,075,929. Three Stage Thrusting Device. Filed Jan. 28, 1976. Patented Feb. 28, 1978. Not available NTIS.

Patent 4,076,454. Vortex Generators in Axial Flow Compressor. Filed June 25, 1976. Patented Feb. 28, 1978. Not available NTIS.

U.S. DEPARTMENT OF THE INTERIOR
Branch of Patents, 400 7th St. SW.
Washington, D.C. 20590

Patent 4,055,074. Window Method for Measuring Leakage. Filed Dec. 30, 1976. Patented Oct. 25, 1977. Not available NTIS.

Patent 4,070,906. Modified Roof Strain Indicator. Filed Dec. 15, 1976. Patented Jan. 31, 1978. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents Office of Naval Research
Code 302, Arlington, Va. 22217

Patent application 834,789. A Shock-Mounted, Liquid Cooled Cold Plate Assembly. Filed Sept. 19, 1977.

Patent application 837,342. High-Accuracy Analog Multipliers. Filed Sept. 28, 1977.

Patent application 849,910. An Acoustic Periodic Structure. Filed Nov. 7, 1977.

Patent application 860,670. Composite Low Frequency Transducer. Filed Dec. 12, 1977.

Patent application 861,148. A Two-Phase Control System. Filed Dec. 12, 1977.

Patent application 863,362. Method for Determining Conduction-Band Edge and Electron Affinity in Semiconductors. Filed Dec. 22, 1977.

Patent application 863,363. Electro-Chemical Sensors for Gas Detection in Electron Tubes. Filed Dec. 22, 1977.

Patent application 868,361. Access Coupler and Duplex Coupler for Single Multimode Fiber Transmission Line. Filed Jan 10, 1978.

Patent application 868,364. Investigation of Near-Surface Electronic Properties in Semiconductors by Electron Beam Scanning. Filed Dec. 22, 1977.

Patent application 871,573. Corner Fed Electric Microstrip Dipole Antenna. Filed Jan. 23, 1978.

Patent application 878,629. Analog and Digital Circuit Tester. Filed Feb. 17, 1978.

Patent application 879,925. Flexible Printed Circuit Board Assembly. Filed Feb. 22, 1978.

Patent application 883,569. Optical Image Modifier. Filed Mar. 6, 1978.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JULY 15, 1978

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	9-6-77
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-17-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	11-17-77
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	7-18-77
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	8-1-77
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	4-8-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	1-13-77
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	7-11-77
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	1-3-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	1-17-77
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	10-14-76
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	6-23-77
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	1-9-77
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	5-11-77
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GRAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	6-2-77
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	1-19-77

Expiration of patents: The patents within the range of numbers indicated below expire during July 1978, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,990,549 to 2,994,086, inclusive
Plant Patents..... Numbers 2,067 to 2,075, inclusive

REISSUES

AUGUST 15, 1978

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

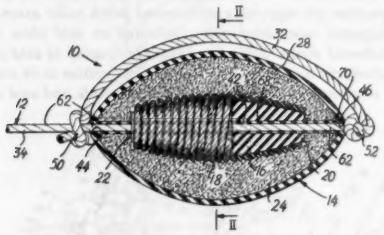
Re. 29,728
LIFESAVING DEVICE

Robert S. Franklin, 12 Blakely Cir., Randolph, Mass. 02368

Original No. 3,974,536, dated Aug. 17, 1976, Ser. No. 580,743, May 27, 1975. Application for reissue Jan. 25, 1977, Ser. No. 762,328

Int. Cl.[2] B63C *9/00*

U.S. Cl. 9—14 **10 Claims**



13. A life-saving device of ellipsoidal shape resembling a football and adapted to be gripped and thrown like one towards a person in distress in a body of water, comprising

(a) a central core of predetermined weight and a mass of solid buoyant material with a yielding and waterproof exterior surrounding said core, to impart to the entire device a specific gravity lower than 1.0 so that it has the combined capability of floating on the body of water and being thrown as far and as accurately as a football,

(b) said device having a central passage extending therethrough along its longitudinal axis, and

(c) a rope lifeline having one end thereof extending through said passage for secure attachment to said device, which upon grasping by said person permits pulling of the person from the opposite end of said lifeline.

Re. 29,729
BUTTONING MEANS

Peter David Benmax, 22 Mare St., London E.G., England

Original No. 3,942,224, dated Mar. 9, 1976, Ser. No. 425,733, Dec. 18, 1973. Application for reissue Mar. 10, 1977, Ser. No. 776,449

Claims priority, application United Kingdom, Jan. 9, 1973, 1187/73

Int. Cl.[2] A44B *1/18*

U.S. Cl. 24—90 B **3 Claims**

1. A buttoning means comprising in combination a pair of hollow tufting buttons at least one of which has an interior wall and each of which are provided with base plate members, said base plate members being provided with centrally disposed apertures capable of being aligned on opposite side portions of material to be tufted, a substantially rigid, elongated shank having a major portion extending to one end of uniform diameter slidably arranged in one of said apertures, a cord secured to one end of said shank and having an enlarged terminal portion positioned on one side of said apertured base plate member adjacent said interior wall, terminal portion being larger than said one aperture to prevent total removal of said cord, said shank means further including at its opposite free end a pointed end, adjacent said pointed end an abutment positioned outwardly from said shank having a greater transverse extent than said one aperture for permanent insertion in said aperture of said other button upon the pointed end end being forced through said material to be tufted, said major portion of said shank being movable completely out of said one aperture.

Re. 29,730
AUTOMATIC RECORD PLAYER

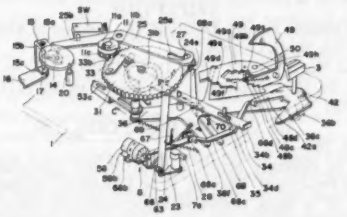
Seizo Miyoshi, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Original No. 3,827,697, dated Aug. 6, 1974, Ser. No. 249,109, May 1, 1972. Application for reissue Aug. 3, 1976, Ser. No. 711,378

Claims priority, application Japan, May 3, 1971, 46-29165

Int. Cl.[2] G11B *17/16*

U.S. Cl. 274—10 R **6 Claims**



5. An automatic record player comprising a turntable drive motor; a switch for said turntable drive motor; means for operating the switch to energize the drive motor; a tone arm having a rotatable shaft; a turntable having a turntable gear thereon and a spindle projecting therefrom; a gear wheel having a substantially heart-shaped groove formed therein, said gear wheel being engageable with the turntable gear; an actuating member operatively coupled to said gear wheel to bring said gear wheel into engagement with said turntable gear; an actuating lever for operating said actuating member; a driving plate having first and second ends and having an upright boss at said first end, which upright boss engages said gear wheel and is moved reciprocally in engagement with said heart-shaped groove formed in said gear wheel; an arm on said second end of said driving plate, said arm being adapted to move said tone arm vertically and horizontally; a positioning mechanism for selecting the dropping position of said tone arm; means for restricting the horizontal swinging movement of the tone arm to inhibit the latter from swinging to a position above the lead-in groove of a record; and a cycle adjusting mechanism including a repeat number setting member having a plurality of sawteeth thereon and a recess defined therein, a plurality of digit characters equal in number to the number of said sawteeth, said digit characters being in the form of a series of numbers 1, 2, 3, 4 ... and n (n being an integer) each representative of the desired number of records to be played by the player, another digit character in the form of a zero number which is adapted to be displayed

when the recess in the setting member is brought to a predetermined position, thereby warning that the desired number of records has been completed, means successively engageable with said sawteeth on the setting member in response to the reciprocal movement of the driving plate for intermittently moving said setting member towards a position where said zero number can be displayed, and a second member engageable into the recess in the setting member, irrespective of the presence and absence of the records on the spindle, when the setting member is brought to said predetermined position, whereby when said second member is engaged into the recess in the setting member held in said predetermined position, said restricting means is brought into operation to inhibit said tone arm from swinging horizontally to a position above the lead-in groove of a record, thereby interrupting the operation of the player irrespective of the presence and absence of the records on the spindle.

Re. 29,731

METAL OXIDE VOLTAGE-VARIABLE RESISTOR COMPOSITION

Herbert Fishman, and James S. Kresge, both of Pittsfield, Mass., assignors to General Electric Company

Original No. 3,928,245, dated Dec. 23, 1975, Ser. No. 377,218, Jul. 9, 1973. Application for reissue Aug. 8, 1977, Ser. No. 822,623

Int. Cl.[2] H01B *1/08*

U.S. Cl. 252—521 **5 Claims**

6. An improved zinc oxide varistor composition of the type containing silicon dioxide as an impurity the improvement which comprises:

the addition of an effective amount up to 0.3 molar percent each of barium oxide and boron oxide impurities.

Re. 29,732

TRIPEPTIDE

George Rogelio Flouret, Deerfield, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Original No. 3,781,272, dated Dec. 25, 1973, Ser. No. 237,877, Mar. 24, 1972. Application for reissue Jan. 31, 1977, Ser. No. 763,787

Int. Cl.[2] C07C *103/52;* **C07G** *7/00*

U.S. Cl. 260—112.5 R **7 Claims**

1. The optically active L-form of the tripeptide Y-(N$^{\omega}$-R')Arg-Pro-Gly-R wherein R is [hydroxy, methoxy or] amino, R' is nitro, p-nitrobenzyloxycarbonyl, tetrachloroisopropyloxyphthaloyl or p-tolylsulfonyl, and wherein Y is hydrogen, tert.-butoxycarbonyl, o-nitrophenylsulfenyl, 2-(diphenyl)isopropyloxycarbonyl, benzyloxycarbonyl or phthalyl.

Re. 29,733

TELEPHONE ANSWERING APPARATUS

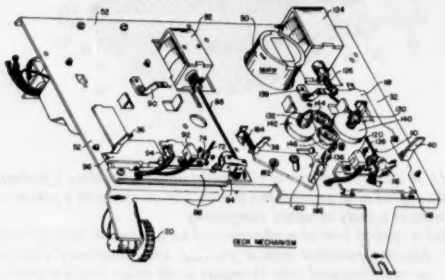
James R. Darwood, Anaheim, Calif., assignor to T.A.D. Avanti, Inc., Paramount, Calif.

Original No. 3,968,329, dated Jul. 6, 1976, Ser. No. 548,413, Feb. 10, 1975. Application for reissue Feb. 4, 1977, Ser. No. 765,546

Int. Cl.[2] G11B *15/68, 5/54*

U.S. Cl. 179—6 R **6 Claims**

10. A telephone answering apparatus including in combination: a housing; means mounted in said housing for receiving a removable magnetic announcement tape unit; first capstan drive means mounted in said housing on one side of the path of the tape in said removable tape unit for driving the tape; a first pinch roller assembly mounted in said housing on the opposite side of the path of said tape; first solenoid means mechanically coupled to said first pinch roller assembly for selectively causing the first pinch roller assembly to be drawn against the tape to move the tape into driving engagement with the first capstan drive means; means mounted in said housing for receiving a removable cassette-type magnetic message tape unit; a second capstan drive means mounted in said housing on one side of the path of the tape in the message tape unit for driving the message tape; a second pinch roller assembly mounted in said housing on the opposite side of the path of the tape in said message tape unit; second solenoid means mechanically coupled to said second pinch roller assembly for selectively moving said second pinch roller assembly toward the second capstan drive means to move the tape in said message tape unit into driving engagement with the capstan drive means; a drive motor mounted in the housing and mechanically coupled to the first and second capstan drive means; first and second spindle means mounted in the housing for receiving the cassette-type message tape unit; mechanical coupling means for selectively coupling the drive motor to the first and second spindle means to drive the tape in the message tape unit selectively in a forward and a rewind direction; third solenoid means connected to said coupling means for changing the coupling of the drive motor from one of the spindle means to the other whenever the third solenoid means is energized; a plate slidably mounted in said housing between a first position and a second position for supporting said second pinch roller assembly; electromagnetic transducer means mounted on said plate, said second solenoid means being mechanically coupled to said plate for selectively moving said plate from its first position to its second position to move said second pinch roller assembly and said elec-



tromagnetic transducer means into operating relationship with respect to the tape in said message tape unit; resilient means coupling said second solenoid means to said plate to permit said plate to be pulled back to its first position, and the pinch roller assembly and electromagnetic transducer means to be pulled back from the tape in said message tape unit, while the second solenoid means is energized; a second plate slidably mounted in the apparatus adjacent said message tape unit and movable between a first and a second position; magnetic erase means mounted on the second plate; resilient means for normally biasing the magnetic erase means to a first position away from the tape in said message tape unit; lever means coupled to the second plate for manually moving the second plate from its first position to its second position against the force of the resilient means to bring the erase means into operating relationship with the tape in said message tape unit; and means mounted on at least one of the first and second plates for causing the first plate to hold the second plate in its second position upon prior movement of the second plate to its second position, and for causing the first plate to prevent movement of the second plate upon prior movement of the first plate to its second position.

Re. 29,734

WELL BORE DATA-TRANSMISSION APPARATUS WITH DEBRIS CLEARING APPARATUS

Kenneth G. Manning, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Original No. 3,764,970, dated Oct. 9, 1973, Ser. No. 263,024, Jun. 15, 1972. Application for reissue Jul. 29, 1977, Ser. No. 820,187

Int. Cl.[2] G01V *1/40*

U.S. Cl. 340—18 NC **27 Claims**

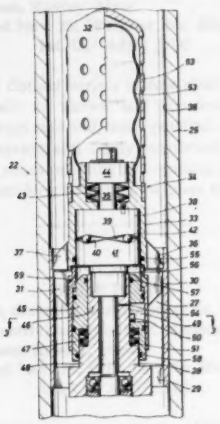
1. Apparatus adapted for transmitting data signals from a well bore to the surface and comprising:

a body adapted for connection in a pipe string and having a fluid passage arranged to carry debris-bearing fluids between the surface and well bore;

a first signal-producing member cooperatively arranged in said fluid passage for directing at least a portion of a fluid flowing therethrough along at least one selected flow path;

first means including a second signal-producing member cooperatively arranged in said fluid passage adjacent to said first member for rotation at a selected speed in a plane transverse to said flow path for repetitively obstructing said flow path at periodic intervals to cyclically produce acoustic data signals in a fluid flowing through said fluid passage;

second means operable upon at least slowing of said second



member below said selected speed in response to an increase in driving torque on said second member for momentarily separating one of said signal-producing members to allow fluid-borne solids flowing through said fluid passage to pass downstream of said signal-producing members; and

third means operable upon at least slowing of said second member in response to an increased pressure differential across said signal-producing members for momentarily separating the other of said signal-producing members from said one signal-producing member to allow fluid-borne solids flowing through said fluid passage to pass downstream of said signal-producing members.

Re. 29,735

ROTATIONAL LIGHTING SYSTEM

Murray Tovi, New York, N.Y., assignor to Murray Tovi Designs, Inc., New York, N.Y.

Original No. 3,924,119, dated Dec. 2, 1975, Ser. No. 496,191, Aug. 9, 1975. Application for reissue May 6, 1976, Ser. No. 683,773

Int. Cl.[2] F21V *21/20*

U.S. Cl. 362—401 **16 Claims**

15. A horizontal, remotely controlled system in which a source of energy can hover over substantially any given region of an area, the system comprising: a first motor element adapted to be fixedly mounted relative to said area, said first motor element having a first rotatable motor shaft; a first elongated support arm having first and second ends, said first support arm being mounted on said first motor shaft intermediate its first and second ends, for rotation with said first motor shaft, and in a substantially horizontal plane; a second motor element suspended from the first end of said first support arm, said second motor element having a second rotatable motor shaft; a second elongated support arm having first and second ends, said second support arm being mounted on said second motor shaft intermediate its first and second ends, for rotation with said second motor shaft, and in a substantially horizontal plane; energy means mounted at the first end of said second support shaft; counterweight means mounted at the second end of said second support arm, weighted and positioned so that said second support arm, said counterweight means and said energy means are in substantial horizontal balance about said second motor shaft; second counterweight means mounted at the second end of said first support arm, weighted and positioned so that said first support arm, carrying the associated second motor element, second support arm, second counterweight means and energy means, is in substantial horizontal balance about said first motor shaft; and control means for independently controlling the operation of said first and second motor elements and thereby the respective rotatable motor shafts, and said energy means; and wherein the distance between the first end of said first support arm and the first motor shaft is substantially equal to the distance between the first end of said second support arm and said second motor shaft.

PLANT PATENTS

GRANTED AUGUST 15, 1978

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,291

ROSE PLANT

Ernest Schwartz, deceased, late of Kingsville, Md. (by Hazel E. Schwartz, executrix), assignor to F. Harmon Saville Nor'East Miniature Roses, Rowley, Mass.

Filed Nov. 25, 1977, Ser. No. 854,510

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—7 **1 Claim**

1. A new and distinct variety of rose plant of the miniature class, substantially as shown and described, characterized particularly by high centered, many petalled coral pink blooms borne both in sprays and singly supported erect on sturdy peduncles with petals reflexing and quilling symmetrically on opening which are long lasting on the plant and as cut flowers.

4,292

ROSE PLANT

Ernest Schwartz, deceased, late of Kingsville, Md. (by Hazel E. Schwartz, executrix), assignor to F. Harmon Saville Nor'East Miniature Roses, Rowley, Mass.

Filed Nov. 25, 1977, Ser. No. 854,511

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—7 **1 Claim**

1. A new and distinct variety of rose plant of the miniature class, substantially as shown and described, characterized particularly by hybrid tea-like high centered, blooms of orange-red to bronze-yellow coloring borne primarily singly to a stem, deepening in tonality upon aging.

4,293

ROSE PLANT

Ernest Schwartz, deceased, late of Kingsville, Md. (by Hazel E. Schwartz, executrix), assignor to F. Harmon Saville Nor'East Miniature Roses, Rowley, Mass.

Filed Nov. 25, 1977, Ser. No. 854,513

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—10 **1 Claim**

1. A new and distinct variety of rose plant of the miniature class, substantially as shown and described, characterized particularly by the unusual coloring which contrasts scarlet red petals of quickly opening flowers with yellow coloring at the base of the petals that, together with dark yellow stamens produce a yellow eye on a vigorous, compact growing plant that blooms profusely.

4,294

ROSE PLANT

Ernest Schwartz, deceased, late of Kingsville, Md. (by Hazel E. Schwartz, executrix), assignor to F. Harmon Saville Nor'East Miniature Roses, Rowley, Mass.

Filed Nov. 25, 1977, Ser. No. 854,514

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—9 **1 Claim**

1. A new and distinct variety of rose plant of the miniature class, substantially as shown and described, characterized particularly by coral pink high centered, recurrent flowers of persistent coloring borne primarily singly to a stem, with reflexing petals folding individually along the entire margin as they mature and are long lasting on the plant.

PATENTS

GRANTED AUG. 15, 1978

ERRATA

For CLASS	See PATENT NO.
308–172	4,106,192
400–144.2	4,106,611
296–023 C	4,106,732
273–080 B	4,106,777
074–108	4,106,925
260–326.5 B	4,107,074
521–032	4,107,097
521–025	4,107,098
521–030	4,107,099
521–137	4,107,100
521–137	4,107,101
521–163	4,107,102
528–072	4,107,103
521–171	4,107,104
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526–212	4,107,144
528–108	4,107,145
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528–172	4,107,147
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528–309	4,107,149
528–307	4,107,150
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528–312	4,107,154
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179–084	4,107,495

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GRANTED AUG. 15, 1978

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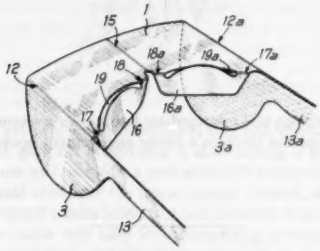
PATENTS

GRANTED AUGUST 15, 1978

GENERAL AND MECHANICAL

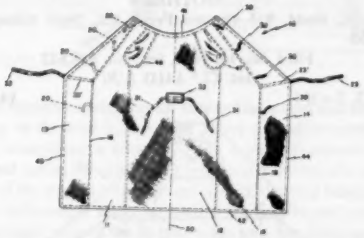
4,106,119
EYE-SHADES
Jean-Paul Taupin, Le Vivier, 58140 Urzy, France
Filed Nov. 5, 1974, Ser. No. 521,204
Claims priority, application France, Nov. 8, 1973, 73 39794
Int. Cl.[2] A61F *9/04*
U.S. Cl. 2—12 **2 Claims**



1. An eye-shade comprising a one piece blank defining a substantially flat brow member having a fold line in a central portion thereof allowing the brow member to be folded in half, a pair of temple members respectively connected to the brow member along a pair of laterally spaced fold lines at opposite sides of the brow member, and a pair of intergral arms respectively extending from said temple members along another pair of fold lines to free ends, said free ends defining cooperating means for securing said arms together thereby to provide a head-encompassing member interconnecting said temple members to cause said brow member to extend outwardly in a substantially horizontal attitude above the wearer's eyes in the position of use with said temple members assuming a substantially vertical attitude; said brow member including an inner edge between said arms and a pair of integral forehead strips forming part of said one piece blank and being foldably connected to said brow member on each side of the fold line in the brow member along a pair of angularly related fold lines, said blank having an opening formed therein along each of said angularly related fold lines to allow said forehead strips to be folded downwardly with respect to said brow member and deform to adapt to the curvature of the wearer's forehead; said brow member and said temple members defining a field of vision within the three sidewalls defined by said members.

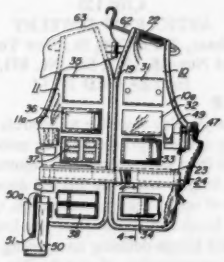
4,106,120
REVERSIBLE SURGICAL GOWN
Charles Edward Zurbrigg, London, and William Douglas Sulman Keenan, Komoka, both of Canada, assignors to Lac-Mac Limited, London, Canada
Continuation-in-part of Ser. No. 625,229, Oct. 23, 1975, abandoned. This application Sep. 12, 1977, Ser. No. 832,571
Claims priority, application Canada, Mar. 24, 1975, 222941
Int. Cl.[2] A41D *13/00*
U.S. Cl. 2—51 **11 Claims**

1. A reversible surgeon's gown, comprising:
a front panel having first and second front panel side margins;
a first back panel extending laterally from said first front panel side margin and having a first back panel side margin;
a second back panel extending laterally from said second front panel side margin and having a second back panel side margin;
a first back flap extending laterally from said first back panel side margin and terminating in a first distal side edge;
a second back flap extending laterally from said second back panel side margin and terminating in a second distal side edge;
a first sleeve member attached between said front panel and said first back panel; a second sleeve member attached between said front panel and said second back panel;
first securing means attached at said first back panel side margin on one surface of said gown;
second securing means attached at said second back panel side margin on the opposite surface of said gown, said first and second securing means being adapted to secure said first back panel side margin to said second back panel side margin to provide secured first and second side margins at the back of the wearer;
first retaining means attached at said first distal side edge;



second retaining means attached at said second distal side edge;
third retaining means attached on said front panel on said one surface of the gown; and
fourth retaining means attached on said front panel on said opposite surface of the gown, said first and fourth retaining means being adapted to retain said first back flap over said secured first and second back panel side margins when said opposite surface is the outside surface of the gown, and said second and third retaining means being adapted to retain said second back flap over said secured first and second back panel side margins when said one surface is the outside surface of the gown.

4,106,121
TACTICAL LOAD BEARING VEST
Gary W. Belson, 25 First St., Barnegat, N.J. 08005
Filed Nov. 29, 1976, Ser. No. 745,964
Int. Cl.[2] A41D *1/04*
U.S. Cl. 2—102 **11 Claims**



1. A snug fitting tactical vest comprising a left vest section and a right vest section, each section having inside and outside surfaces and a front and a rear longitudinal edge,

means for separably connecting together a portion of said front edges of said left and right vest sections,

means for adjustably connecting in accordance with the fit of the wearer at least a portion of the rear edges of said left and right vest sections,

at least one removable supply pouch having a rear surface, and

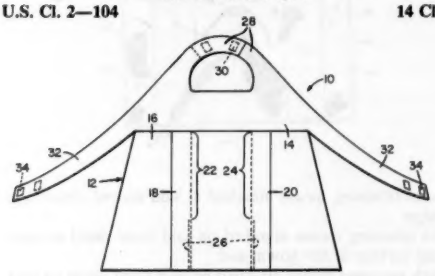
hook and mesh fastening means comprising at least one fastening strip of hook devices and at least one fastening strip of mesh devices, at least one fastening strip of one device type being secured to said rear surface of said pouch, at least one fastening strip of the other device type being secured to said outside surface of said vest for engaging the pouch fastening strip thereby to releasably secure the entirety of said pouch to said vest.

4,106,122

HALTERED COVER GARMENT FOR NURSING MOTHERS

Laura M. Dodd, 815 Captain Frank Rd., New Albany, Ind. 47150

Filed Jul. 14, 1977, Ser. No. 815,522
Int. Cl.[2] A41D *1/20*
U.S. Cl. 2—104 **14 Claims**



1. A haltered cover garment for nursing mothers comprising a bib having

an upper portion defining a neck halter, and

a lower portion extending from said neck halter downward across the chest of the wearer a distance at least sufficient to cover her breasts, said lower portion containing a pair of flaps extending across the breasts and overlying a pair of openings formed through said bib in the areas of each breast, said lower portion further comprising

a pair of side pieces of material, the outside edges of which terminate along the sides of the wearer, and

a central rectangular piece of material, the sides of which overlap the inside edges of said side pieces to form said flaps.

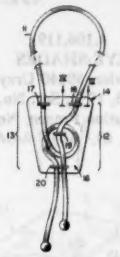
4,106,123

ARTICLE OF JEWELRY

Melvin H. Freedman, 200 E. 27th St., New York, N.Y. 10016

Filed Nov. 15, 1977, Ser. No. 851,626
Int. Cl.[2] A41D *25/14*
U.S. Cl. 2—152 R **3 Claims**

1. An article of jewelry operable to encircle a portion of the body comprising (a) a length of flexible material of uniform cross-section and (b) a slide operable to adjustably engage two portions of said length, said slide having disposed on its rear surface (i) a pair of upper engagement hoops, (ii) an intermediate engagement hoop and (iii) at least one lower engagement hoop, each of said hoops defining an opening having a height greater than the cross-section of said flexible material but less than twice said cross-section, a first of said portions of flexible material passing through one of said upper hoops, around said intermediate hoop, crossing over or under itself so as to form a loop and out through said lower hoop and the other portion of said flexible material passing through the second of said upper hoops, over an area of the loop formed by said first



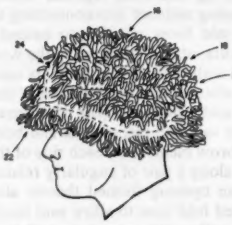
portion, through said intermediate hoop, over a second area of said loop and out through a lower engagement hoop.

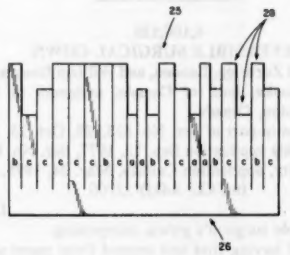
4,106,124

SNAGPROOF HELMUT CAMOUFLAGE COVER

Charles Emmons Green, Deland, Fla., assignor to Brunswick Corporation, Skokie, Ill.

Filed Mar. 9, 1977, Ser. No. 775,925
Int. Cl.[2] A42B *1/24*; A42C *5/00*
U.S. Cl. 2—187 **12 Claims**





1. A camouflage disrupter element comprising

(a) a band of flexible material having a top and a bottom lateral edge,

(b) a plurality of substantially snagproof blade-like elements extending from both lateral edges of said band in random direction forming a downward extending and an upward extending three dimensional grass-like pattern, and

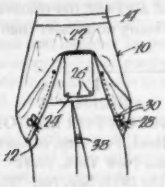
(c) said blade-like elements being resilient and capable of substantial recovery of shape upon being disarranged.

4,106,125

CONVERTIBLE GARMENT

Angeline Palumbo, 3511 N. Narragansett, Chicago, Ill. 60634

Filed Oct. 20, 1976, Ser. No. 734,344
Int. Cl.[2] A41D *1/14*
U.S. Cl. 2—213 6 Claims



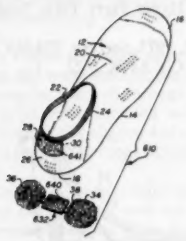
1. A garment made of material and convertible between a skirt-like garment comprising a skirt having a lower margin and a front and rear side, a central crotch means secured at one end to said skirt near the lower margin thereof, the other end of said crotch means being free and movable from a concealed position inside said skirt to a connecting position extending between said front and rear sides, means on an interior surface of said skirt spaced from the secured end of said crotch means for releasably securing the free end of said crotch means in said concealed position, and means on said skirt for releasably gathering the material of said skirt and drawing said crotch means around the legs of the wearer near the bottom margin of said skirt, said gathered material and crotch means together defining leg portions of the garment.

4,106,126

WITHIN-THE-SHOE SOCK HAVING REMOVABLE RETAINING DEVICE

William J. Traenkle, 61 Old Ox Rd., Manhasset, N.Y. 11030

Continuation-in-part of Ser. No. 589,444, Jun. 23, 1975, Pat. No. 4,055,858. This application Aug. 11, 1977, Ser. No. 823,623
Int. Cl.[2] A41B *11/00;* A43B *3/10;* A43C *9/00*
U.S. Cl. 2—240 9 Claims



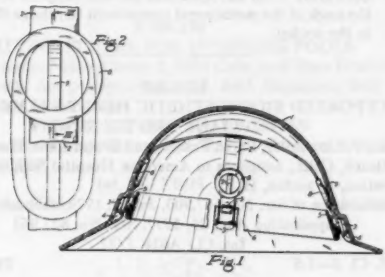
1. A within-the-shoe sock construction comprising a sock having a foot opening adapted to receive a foot therethrough, the height of said sock being substantially coextensive with the height of a shoe to be worn with said sock whereby the upper rear edge of the sock is substantially coterminous with the upper rear edge of the shoe; retaining means detachably securred to said sock and engagable with the rear edge of a shoe for retaining said sock in position on the foot of the wearer, said retaining means comprising an enlarged member, and a relatively narrow support member connected to said enlarged member; and a press-on peel-off separable fastener on said sock and said support member for detachably connecting said retaining means to said sock.

4,106,127

ENERGY ABSORBING SUSPENSION ELEMENT

Roy D. Marangoni, Pittsburgh, and Harry W. Austin, Monroeville, both of Pa., assignors to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed Jun. 25, 1976, Ser. No. 699,998
Int. Cl.[2] A42B *3/02*
U.S. Cl. 2—416 3 Claims



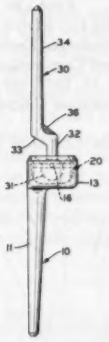
1. A suspension element for suspending a load and absorbing energy of the load is increased above a predetermined minimum, comprising a normally rigid molded nonbrittle plastic ring and means for connecting only two diametrically opposite areas of the ring to a support and a load, the ring being permanently deformable under an applied load above said minimum, the opposite sides of the ring between said two areas being free of any connecting means and bulging away from each other and said connecting means, and said bulging opposite sides of the ring being subject to being pulled toward each other permanently and straightened if the load suspended by the ring increases beyond said predetermined minimum and reduces the width of the ring by elongating the ring in the direction of the load, whereby the energy required to thus deform the ring is absorbed by the ring.

4,106,128

ENDOPROSTHETIC BONE JOINT

A. Seth Greenwald, 2235 Tudor Dr., Cleveland Heights, Ohio 44106; Derek S. Porritt, 3263 Granger Rd., Medina, Ohio 44256, and Mary-Blair Matejczyk, 3617 Randolph Rd., Cleveland Heights, Ohio 44121

Filed Dec. 6, 1976, Ser. No. 747,502
Int. Cl.[2] A61F *1/24*
U.S. Cl. 3—1.91 4 Claims



3. A wrist joint comprising:

a. a first radial component having a tapered intramedullary stem;

b. a cup fixedly connected thereto and offset to one side;

c. a socket fitted within the cup and further having a spherical surface covering substantially more than a hemisphere;
d. a metacarpal component having a ball, a neck portion and an intramedullary stem;
e. said radial component and said metacarpal stem being coextensive;
f. said ball fitted within said spherical surface of said socket, and further having an offset in the neck portion; and
g. said socket having a frusto-conical surface extending outwardly from the spherical surface adapted to engage the neck of the metacarpal component to relieve the stress in the socket.

4,106,129

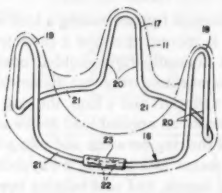
SUPPORTED BIOPROSTHETIC HEART VALVE WITH COMPLIANT ORIFICE RING

Alain F. Carpentier, Paris, France, and Ernest Lane, Huntington Beach, Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Continuation of Ser. No. 647,900, Jan. 9, 1976, abandoned. This application Aug. 26, 1977, Ser. No. 827,961

Int. Cl.[2] A61F *1/22*

U.S. Cl. 3—1.5 **29 Claims**



16. A flexible stent for supporting a valvular graft, said stent having an annular frame formed of spring wire, said frame including a triad of axially-projecting circumferentially-spaced commissure supports, each commissure support being of inverted U-shaped configuration having wire legs normally spaced substantially apart, the lower end portions of said legs merging smoothly with arcuate connecting segments of said frame extending circumferentially between and joining the adjacent legs of adjoining commissure supports, said U-shaped commissure supports and said connecting segments being formed integrally from the same piece of spring wire, each of said arcuate connecting segments having a major portion of the length thereof extending along a plane normal to the axis of said stent.

4,106,130

ENDOPROSTHETIC BONE JOINT DEVICES

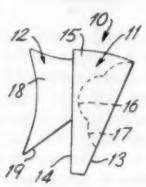
John Tracy Scales, Stanmore, England, assignor to National Research Development Corporation, London, England

Filed Feb. 11, 1977, Ser. No. 767,949

Claims priority, application United Kingdom, Feb. 20, 1976, 6803/76

Int. Cl.[2] A61F *1/24*

U.S. Cl. 3—1.91 **9 Claims**



1. An endoprosthetic bone joint device comprising two components respectively adapted for securement to different bones of the relevant joint, and respectively including male and female bearing parts in mutual articulatory engagement, the male part having a rounded convex bearing surface, the female part having a compound concave bearing surface including a cupped area bounded by an annular troughed area, and the curvature of said cupped area and the transverse curvature of said troughed area each being no greater than the curvature of said convex surface.

4,106,131

WATER DISTRIBUTOR FOR SIPHON CLOSET

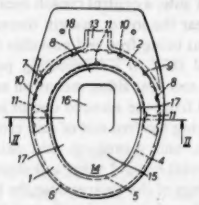
Wilfried Delker, Bonn-Beuel, Fed. Rep. of Germany, assignor to American Standard Inc., New York, N.Y.

Filed Apr. 11, 1977, Ser. No. 786,245

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1976, 2616742

Int. Cl.[2] A47K *17/00*; E03D *11/00*

U.S. Cl. 4—1 **6 Claims**



1. A water distributor adapted for use in a siphon closet of the type having an open flush rim, the distributor comprising:
a strip of relatively rigid, generally flat but sufficiently flexible material adapted to be inserted and positioned under tension in a siphon closet to at least partially close the open flush rim therein, said strip being arcuately formed and having a generally larger radius of curvature in its unflexed position than said flush rim and said strip having an arrangement of apertures formed therein to provide passageways from the at least partially closed flush rim.

4,106,132

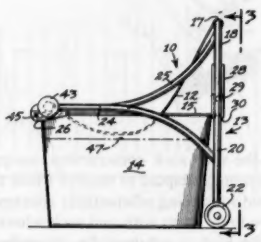
SITZ BATH

Albert D. Warren, New Hydes Ferry Pike, Nashville, Tenn. 37218

Filed Mar. 7, 1977, Ser. No. 774,961

Int. Cl.[2] A47K *3/22*

U.S. Cl. 4—6 **4 Claims**



1. A sitz bath comprising:
(a) a seat support frame having a front portion and a back portion,
(b) said back portion comprising a rear transverse member,
(c) an elongated, flexible seat member having a front end portion and a rear end portion, the longitudinal axis of said seat member extending front-to-rear,

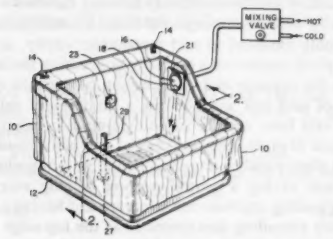
(d) rear securing means stationarily securing the rear end portion of said seat member to said rear transverse member,
(e) windlass means including a rotary spindle rotatably mounted on said front portion spaced in front of, below, and substantially parallel to said rear transverse member,
(f) front securing means securing the front end portion of said seat member to said rotary spindle for winding and unwinding said seat member suspended between said rear transverse member and said rotary spindle,
(g) means for holding said spindle in a non-rotary position, to hold said seat member at different adjusted elevated positions relative to said frame device, so that the legs of a person seated lengthwise of the longitudinal axis of said seat member extend over said spindle,
(h) a liquid-receiving receptacle, and
(i) means on said seat support frame detachably connecting said receptacle below said seat member, and within which said seat member is adapted to be suspended in various adjusted elevated positions.

4,106,133

CONTAMINATION PREVENTION DEVICE FOR SITZ BATH

Thomas J. Roberts, 1233 Somerset La., Elk Grove, Ill. 60007

Filed May 9, 1977, Ser. No. 795,408
Int. Cl.² A47K *3/22*
U.S. Cl. 4—6 **1 Claim**



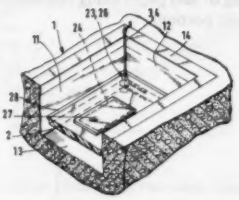
1. A sitz bath arrangement comprising:
a sitz bath having sidewalls and a bottom;
a drain in the bottom of said sitz bath;
a water inlet extending through one of the sidewalls of said sitz bath;
a generally elliptical shaped diverter mounted on and surrounding said water inlet on the inside of the sitz bath and adjacent to the sidewall through which the inlet extends, said diverter being oriented such that its major axis is generally vertically aligned and said diverter being dished so that its two end portions extend away from the adjacent sidewall;
a disposable, flexible water-tight liner, made of plastic film, for lining the inside of said sitz bath and having a hole which permits the liner to be placed over the water inlet and hung on said diverter, said liner being placed behind both end portions of said diverter to insure that the incoming water, which may flow continuously through said water inlet, runs into the lined sitz bath and not behind said liner,
said liner providing a barrier to block the transmission of bacteria between the water and sitz bath to preclude cross-infections between the various patients that use the sitz bath;
a plastic collar attached to and surrounding a drain opening in said liner and having a depending cylindrical section that extends into the sitz bath's drain in order to communicate the liner's drain opening with the bath's drain, an annular ring being formed on the external surface of said cylindrical section to provide a sealing ring,
said cylindrical section having a circumferential lip extending around its internal cylindrical surface to provide a support;
and a removable plastic standpipe which is inserted into said collar and is supported on said circumferential lip,
the water, which flows constantly into the lined sitz bath, being drained off at the top of said standpipe, the water level in the bath thereby being determined by the height of the standpipe.

4,106,134

LIFTING FLOORS FOR SWIMMING POOLS

Klaus Schiron, Nelkenstrasse 2, 3100 Celle, and Hans Friedrich Rupprath, Am goldenen Acker 35, 3001 Bennigsen, both of Fed. Rep. of Germany

Filed Dec. 22, 1976, Ser. No. 753,208
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1975, 2557881
Int. Cl.² E04H *3/19*
U.S. Cl. 4—172.13 **11 Claims**



1. A swimming pool in combination with a lifting floor, comprising:
said swimming pool having integrally joined bottom, longitudinal and transverse walls forming an upwardly opening bathing enclosure, and a generally horizontal rim extending peripherally around the entire upper edges of said longitudinal and transverse walls;
said lifting floor being mounted within said enclosure without permanent attachment to said enclosure, said lifting floor including a self supporting floor generally overlying said bottom wall, a plurality of lifting columns extending through said floor immediately adjacent and generally parallel to said longitudinal and transverse walls, said lifting columns supportingly resting on said bottom wall to extend vertically upward towards said rim, driving means mechanically connected only between each of said lifting columns and that portion of the floor adjacent the corresponding lifting column independently of said longitudinal and transverse walls for selectively changing the elevation of said floor with respect to said bottom wall while supporting the entire weight of said floor on said lifting columns, each of said lifting columns being braced against said floor to prevent said lifting columns from tipping inwardly away from said longitudinal and transverse walls, means only slidably engaging the adjacent portions of said longitudinal and transverse walls without permanent modification of said longitudinal and transverse walls for preventing outward tipping of said floor and columns, and said floor lifting columns and driving means being unconnected with said longitudinal and transverse walls.

4,106,135

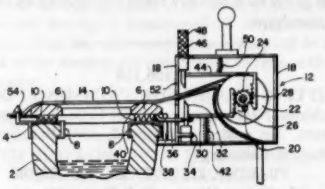
WATER CLOSET BASIN ASSEMBLY

Daniel I. Mannheim, Corona, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y.

Filed Aug. 30, 1977, Ser. No. 828,985
Int. Cl.² A47K *13/18*
U.S. Cl. 4—247 **10 Claims**

1. Water closet basin assembly comprising a basin having an

endless upper edge, a basin seat shape complementarily to said edge and adapted to overlie said edge, bracket means fixed to said edge and having an elastomeric portion adapted to be disposed between said edge and said basin seat, said elastomeric portion being compressible when subjected to pressure



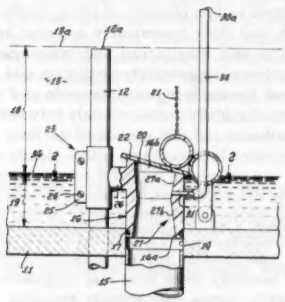
and expandable to its original shape when said pressure is removed, and dispenser means proximate said basin and operative to dispense paper suitable for disposition overlying said seat, dispensing of said paper being responsive to movement of said elastomeric portion.

4,106,136

TOILET FLUSH FLOW ACCELERATOR

Richard L. Lippincott, Sr., 22122 Wood Island, Huntington Beach, Calif. 92646

Filed May 23, 1977, Ser. No. 799,514
Int. Cl.[2] E03D *1/06*
U.S. Cl. 4—368 **7 Claims**



1. In combination with a toilet flush tank having a bottom wall drain opening, the improvement comprising:

(a) a tubular body adjustably located in drain communication with said opening and having an inlet spaced above the level of said opening so that only tank water above the level of said inlet will flow downward through said body during the toilet flush cycle,

(b) the body containing a venturi to accelerate said flow, the venturi located in direct vertically aligned communication with said drain opening, and below said inlet,

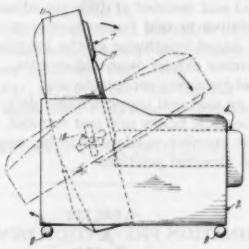
(c) there being ducting in communication with said venturi via the side thereof for passing air to water flow through the venturi, the ducting having an inlet for air at atmospheric pressure.

4,106,137

SOFA BED

Réal Leclerc, 241 St. Vallier St., West, Quebec, Canada (G1R 3B5)

Filed Apr. 13, 1977, Ser. No. 787,282
Claims priority, application United Kingdom, Apr. 14, 1976, 76/15204
Int. Cl.[2] A47C *17/04*
U.S. Cl. 5—24 **4 Claims**



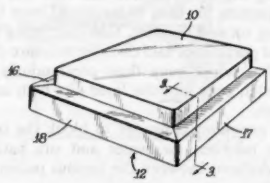
1. A sofa-bed comprising a base having a top seating portion, a pair of opposite end structures fixedly secured to the opposite ends respectively of the base and upwardly projecting therefrom, a backrest-bed unit having a box-shaped peripheral frame construction and a rigid panel fixed to the peripheral frame construction and cooperatively forming therewith a rectangular cavity within the peripheral frame construction, a mattress removably mounted in said rectangular cavity, and a pair of single pivot connections pivotally connecting the backrest-bed unit to the opposite end structures at the opposite ends respectively of said unit and defining a single pivot axis extending above said base, each of said single-pivot connections including a pair of pivot members, one of said pivot members constitutes a plate rigidly secured to one of said opposite end structures and having a central portion bulging away from the corresponding opposite end structure and having a slot therein inwardly extending downward from the top edge thereof and constituting a pivot recess and the other of said pivot members rigidly secured to the end of said backrest-bed unit and including a pivot pin projecting endwise relative to said backrest unit and laterally engageable and pivotable into the slot of the corresponding one pivot member.

4,106,138

PLATFORM BED

Timothy P. Murphy, Chatham, N.J., assignor to Simmons Company, Atlanta, Ga.

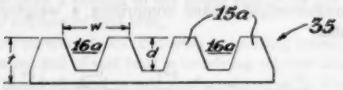
Filed Sep. 28, 1977, Ser. No. 837,392
Int. Cl.[2] A47B *22/00;* **A47C** *17/86*
U.S. Cl. 5—181 **5 Claims**



1. A bed platform for supporting a mattress, comprising a resilient mattress foundation and a sectional bolster structure flanking the foundation in abutting relation, each bolster section having a flat base to support the same upon the floor and a body portion rising from the base alongside the foundation, said base extending sidewardly from said body portion to

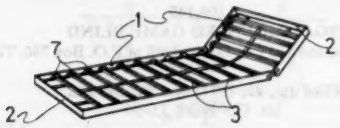
underlie the adjacent edge of the base frame of the foundation, said foundation resting upon the base extensions of said bolster sections to maintain the assembly of said sections therewith.

4,106,139
MATTRESS FOUNDATION
Robert W. Southard, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.
Filed Nov. 19, 1975, Ser. No. 633,540
Int. Cl.[2] A47C *23/00*
U.S. Cl. 5—186 R **9 Claims**



1. A mattress foundation comprising in cooperative combination a generally rectangular slab-like cushioning element, the cushioning element having a first or upper major surface and a second or lower major surface, the cushioning element defining a plurality of corrugations on the second surface and the first surface being of a generally planar configuration, a support member disposed adjacent the second surface and in contact with at least a portion thereof, the support member adapted to maintain the cushioning element at a desired height above a support plane such as a floor, said mattress foundation having a thickness "*t*," a frequency of corrugation "*w*," and a depth of corrugation "*d*," wherein *d* is from about 0.4 to 0.95T.

4,106,140
BODY SUPPORTING FURNITURE FRAME
Anton Kievits, Brussels, Belgium, assignor to N. V. Bekaert S.A., Zwevegem, Belgium
Filed Feb. 11, 1977, Ser. No. 767,965
Claims priority, application Belgium, Feb. 18, 1976, 838669
Int. Cl.[2] E03B *1/00*
U.S. Cl. 5—191 **6 Claims**



1. In a body supporting furniture frame having two opposite longitudinal girders and a plurality of mutually parallel cross-girders disposed therebetween and wherein at least the edges of the cross-girders are provided with a lengthwise aperture in which a wire or bar is loosely inserted, and said wires or bars are bent convexly upward in the longitudinal direction, the improvement in accordance with which the cross-section of each lengthwise aperture and the cross-section of the corresponding wire or bar are designed with a mutually cooperating structural configuration such that the wire or bar is blocked in the lengthwise aperture against rotation through an angle exceeding 90°.

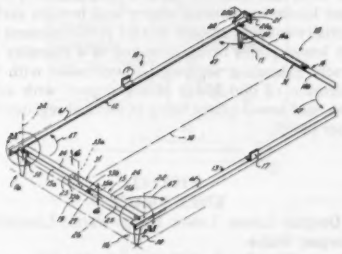
4,106,141
BED FRAME
Joe Bryan Hooker, Lexington, N.C., assignor to Leggett & Platt, Incorporated, Carthage, Mo.
Filed Mar. 24, 1977, Ser. No. 780,720
Int. Cl.[2] A47C *19/00*
U.S. Cl. 5—201 **13 Claims**

1. A novel leg structure for a bed frame, said bed frame being of the type that includes a right angle rail and a leg rail pivotally connected to that right angle rail for swinging movement between a storage position in which the leg rail is oriented parallel to the right angle rail, and a use position where the leg rail is oriented normal to the right angle rail, said leg structure comprising

a leg member mountable to said leg rail at a location adjacent the pivotal connection of said leg rail with said right angle rail,

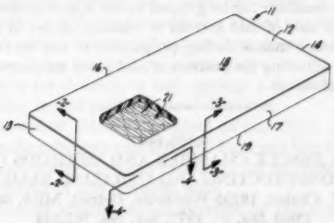
a latch tab connected with said leg member by a neck having a width less than the width of said latch tab, said latch tab extending normal to said leg member's longitudinal center plane, and said latch tab being spaced above said leg member's top edge, and

said latch tab and neck cooperating to define two slots, said two slots being in a slot plane normal to said leg member's



longitudinal center plane, said two slots being disposed in generally mirror relation one to the other on opposite sides of said leg member's longitudinal plane, said two slots being oriented to open away from one another in that mirror relation, said right angle rail's horizontal web being receivable in one of said slots as said leg rail is pivoted from the storage attitude to the use attitude for locating said right angle rail's horizontal web beneath said latch tab to support said leg rail relative to said right angle rail when the bed frame is erected, and said latch tab and neck structure permitting said leg member to be mounted to said leg rail at any bed frame corner defined by said leg rail and said right angle rail without regard to left hand side or right hand side of said leg rail.

4,106,142
MATTRESS CONSTRUCTION
Paul S. Schuder, Rte. 1, Box 1155, Woodland, Calif. 95695
Filed Sep. 26, 1977, Ser. No. 836,717
Int. Cl.[2] A47C *21/00*
U.S. Cl. 5—345 R **3 Claims**



1. A mattress construction comprising:

a. a rectangular, normally horizontal, resilient foam material body extending longitudinally between opposite ends, transversely between opposite sides, and vertically between a top surface and a bottom surface;

b. a plurality of discrete elongated upper plates embedded in said body and disposed in a upper, normally horizontal plane located a predetermined distance below said top

surface, said upper plates being arranged in a plurality of transversely extending separated upper rows with the long dimension of said upper plates aligned with said upper rows;

c. a plurality of discrete elongated middle plates embedded in said body and disposed in a central, normally horizontal plane located equi-distant between said top surface and said bottom surface, said middle plates being arranged in a plurality of transversely extending separated middle rows with the long dimension of said middle plates aligned with said middle rows, said upper rows being vertically above said middle rows and the end portions of said upper plates being in overlapping relation with respect to the end portions of said middle plates below said upper plates; and,

d. a plurality of discrete elongated lower plates embedded in said body and disposed in a lower, normally horizontal plane located a distance above said bottom surface substantially equal in amount to said predetermined distance, said lower plates being arranged in a plurality of transversely extending separated lower rows with the long dimension of said lower plates aligned with said lower rows, said lower plates being in vertical register with said upper plates.

4,106,143

KNEE BRACE

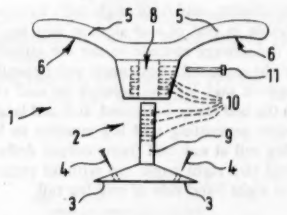
Gareth Douglas Lucas, Lower House Farm, Llantwit Major, Glamorgan, Wales

Filed Jul. 8, 1977, Ser. No. 813,853

Claims priority, application United Kingdom, Jul. 8, 1976, 28482/76

Int. Cl.[2] B63B *29/00*

U.S. Cl. 9—1.7 **3 Claims**



1. A surf-ski wherein there is a hull, a deck secured to the hull, a cockpit area in the deck and brace means, said brace means projecting from said cockpit generally amidships of said surf-ski and comprising support means integral with said surf-ski, brace members projecting laterally of said support means at a position spaced above said cockpit at a height such that said brace members can be gripped by the upper surfaces of the thighs of a user of said surf-ski to transmit thrust of the user into the brace means during propulsion of the surf-ski, and means for adjusting the position of said brace members relative to said surf-ski.

4,106,144

SEA RESCUE CHAMBER AND METHODS OF CONSTRUCTING AND UTILIZING SAME

Bernard T. Chabot, 18235 Woodbine, Detroit, Mich. 48219

Filed Jan. 27, 1977, Ser. No. 762,849

Int. Cl.[2] B63C *9/06*

U.S. Cl. 9—4 R **7 Claims**

1. A buoyant sea rescue chamber comprising:

a substantially enclosed hull portion;

first means for releasably securing said hull portion to a suitable section of a ship to secure said hull portion in a stored position;

at least one water-sealed door disposed in said hull portion;

said hull portion being provided with adjustable counterweight means adjacent an exterior surface thereof for selectively controllably stabilizing said hull portion when it is afloat;

second means for adjusting the relative position of said counterweight means with respect to said exterior surface of said hull portion;

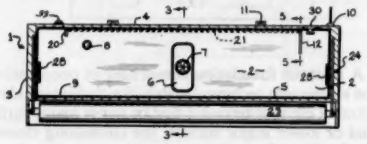
third means for selectively ventilating said hull portion;

said hull portion being adapted to be releasably secured to the cabin section of a ship;

said hull portion having disposed coextensive with the interior surface thereof a layer of insulating material;

said hull portion being defined by a substantially horizontal top wall and bottom wall and substantially vertical side walls;

said counterweight means comprising a weighted shaft member;



said weighted shaft member being adjustably disposed adjacent the exterior surface of said bottom wall;

said second means comprising retractable support members depending downwardly from said hull portion and being secured to said shaft member;

said hull portion having a substantially rectangular cross section;

two of said retractable support members being provided, each of said support members being secured to an end portion of said weighted shaft member;

said two support members depending downwardly from opposite side walls of said hull portion; and

said first means permitting said chamber to be released from said cabin section when said hull portion is buoyed upwardly by water contacting said bottom wall.

4,106,145

BOAT MOUNTED GAME BLIND

John E. Gillen, and Gary C. Odom, both of P.O. Box 756, Tioga, La. 71477

Filed Jul. 25, 1977, Ser. No. 819,012

Int. Cl.[2] B63B *35/00*

U.S. Cl. 9—5 **1 Claim**

1. In a hunting blind in combination with a small open boat having gunwales, the improvement comprising:

a pair of brackets respectively secured to each gunwale in transversely aligned relation,

each bracket of said pair of brackets comprising a pair of plates vertically disposed edgewise in parallel spaced relation;

a plurality of inverted U-shaped bow means extending between and secured to said pairs of plates for forward and rearward vertical pivoting movement about a horizontal axis between a first blind closed position and a second blind opened position,

said bow means comprising a forward bow, a door bow and a rearward bow having depending leg end portions disposed, respectively, between the forward, intermediate and rearward portions of said pairs of plates;

a forward stop pin extending through each pair of said pairs of plates forwardly of said forward bow for normally maintaining said forward bow in said first position;

a rearward stop pin extending through each pair of said plates rearwardly of said door bow for normally preventing rearward movement of said door bow beyond said second position;

a forward fabric covering having a marginal edge portion overlying a portion of the upper surface of the forward end portion of said boat and having a rearward end portion secured to said forward bow;

a rearward fabric covering having a marginal edge portion overlying a portion of the upper surface of the rearward end portion of said boat,

said rearward fabric covering projecting toward the forward end of said boat in overlying relation with respect to and secured to said rearward and door bows,

whereby said forward and rearward fabric coverings normally conceal a hunter when seated in said boat and forms an upwardly and forwardly open space at least partially exposing the hunter when said door and rearward bows are pivoted to said second position; and,

fastening means securing said fabric coverings marginal edge portions to said boat.

4,106,146

CONNECTING ARRANGEMENT BETWEEN A FLOATING STRUCTURE AND AN ANCHOR

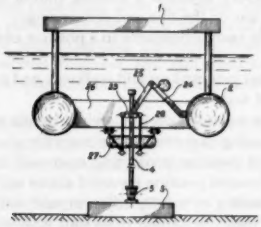
Roger Maari, Roquebrune Cap Martin, France, assignor to Single Buoy Moorings Inc., Fribourg, Switzerland

Filed Feb. 15, 1977, Ser. No. 768,894

Claims priority, application Netherlands, Oct. 29, 1976, 7612046

Int. Cl.² B63B *21/52*

U.S. Cl. 9—8 P **7 Claims**



1. In a connecting arrangement between a floating structure and an anchor, comprising an upwardly extending connecting means connected at its lower end to an anchor by means of a pair of horizontal perpendicular pivot axes, and an arm extending transversely to the upwardly extending connecting means and having one end connected for vertical swinging movement about a horizontal axis to the floating structure and having an opposite end adjacent to and connected for swivelling movement about the upwardly extending connecting means; the improvement in which there are plural said arms extending in different directions away from the upwardly extending connecting means, said plural arms being connected to the floating structure for vertical swinging movement relative to each other about different horizontal axes, and links having one end pivotally interconnected to the ends of the arms adjacent the upwardly extending connecting means, for vertical swinging movement relative to each other and relative to said arms about different horizontal axes, and having opposite ends remote from said arms universally connected to said upwardly extending connecting means.

4,106,147

STOP MECHANISM FOR SHEARING APPARATUS

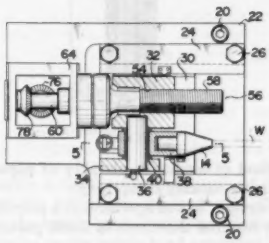
Takashi Furuto, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Mar. 21, 1977, Ser. No. 779,567

Claims priority, application Japan, Mar. 19, 1976, 51-29310

Int. Cl.² B26D *7/16*

U.S. Cl. 10—25 **2 Claims**



1. An apparatus with a fixed and a movable shear element for shearing a workpiece of wire or rod shape into desired lengths in which the workpiece is fed intermittently in a predetermined direction along the axis thereof through the fixed shear element, a stop device comprising, in combination of:

(a) frame means for defining a guideway extending in said predetermined direction;

(b) a carriage mounted on said frame means movable along said guideway toward and away from said fixed shear element;

(c) a stop member having at the distal end thereof a stop surface facing and abutting against a sheared face of the workpiece and mounted on said carriage in a manner such that pivotal movement is permitted about an axis extending perpendicular to said predetermined direction, said stop member being rotated about said axis in one direction by receiving the reaction of the shearing operation thereby absorbing the shock of shearing operation;

(d) resilient means mounted on said carriage for always biasing said stop means in a direction opposite to said one direction;

(e) means for limiting the pivotal movement of said stop member in the direction opposite to said one direction so as to restrain the bias of said resilient means, said limiting means being mounted on said carriage;

(f) means for defining in said carriage a threaded hole extending in said predetermined direction;

(g) a first shaft rotatably mounted on said frame means and extending through said threaded hole, said first shaft being at least partly threaded externally for engagement with the thread of said threaded hole;

(h) manually actuable means mounted on said frame means for imparting rotation to said first shaft so as to adjustably moving said carriage along said guideway toward and away from said fixed shear element;

(i) a second shaft rotatably mounted on said frame means;

(j) handle means for manually rotating said second shaft relative to said frame means;

(k) gearing means for transmitting the rotation of said second shaft to the first shaft; and

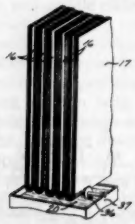
(l) means for locking said second shaft against rotation in a desired angular position.

4,106,148

METHOD OF BINDING PAPERS

Herbert R. Axelrod, 211 W. Sylvania Ave., Neptune, N.J. 07753

Filed Nov. 29, 1976, Ser. No. 745,872
Int. Cl.[2] B42C *19/00*
U.S. Cl. 11—1 AD 12 Claims



1. A method of binding a plurality of papers arranged in sheaves within a backing comprising

cutting a straight line of apertures in a plurality of papers to remove material therefrom in linear patterns across each paper;

position said papers in juxtaposition with patterns of apertures of said papers mutually aligned in a straight line and at least partially linearly offset from each other;

folding said papers along said straight line of apertures to expose layers of material of each of said papers between said apertures for access by an adhesive applicator from one side of said plurality of papers;

applying an adhesive substance to said exposed layers of material in a single step; and

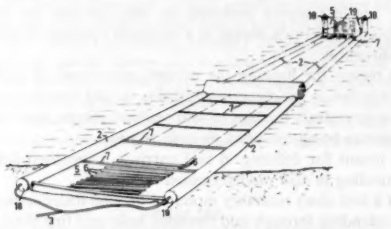
contacting a backing with said adhesive to bond said backing to said exposed layers of material of each of said papers.

4,106,149

INFLATABLE FLOATING BRIDGE, LAID OUT BY INFLATING LONGITUDINAL HOSES IN THE BRIDGE

Erik Johan Larsson, Gamleby, Sweden, assignor to Barracudaverken AB, Sweden

Filed Jun. 7, 1977, Ser. No. 804,470
Claims priority, application Sweden, Jun. 18, 1976, 7607048
Int. Cl.[2] E01D *15/14*
U.S. Cl. 14—27 13 Claims



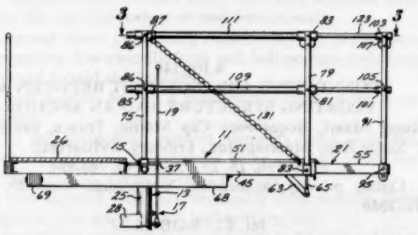
1. An inflatable floating bridge which can be rolled up or folded up when it is not inflated, comprising at least two inflatable hoses, arranged in generally parallel spaced relationship with each other, said hoses having means connectable to a source of gas under pressure for inflating said hoses and laying out the bridge, said hoses in an inflated condition constituting buoyant longitudinal side supporting means of the bridge, a sheet constituting a bridgeway extending between said hoses, each side edge portion of the sheet being joined in fluid-tight relationship to one of the hoses; a plurality of at least partially flexible load distributing means extending transversely across a major portion of said sheet, the distal ends of said load distributing means being spaced from said hoses along lines defining longitudinally extending marginal portions of said sheet adjacent said hoses; and longitudinally separated spacing means for separating the hoses so that, when a load is imposed on said sheet and said load distributing means, loaded portions of said sheet are depressed below the lower limits of said hoses with said marginal portions extending generally upwardly from said sheet to said hoses to form, with said sheet, a hull-like displacement volume for supporting the load.

4,106,150

ELEVATED LOADING PLATFORM

Robert M. Irwin, 3249 Cherry Ave., Long Beach, Calif. 90807

Filed Oct. 25, 1977, Ser. No. 844,891
Int. Cl.[2] E01D *1/00*
U.S. Cl. 14—71.3 12 Claims



1. An elevated loading platform to be suspended from an elevated walkway adjacent a loading station for receiving a railroad tank car or the like and comprising:

a retractable ramp extendable to a position over said loading station;

swivel means mounted on said walkway and pivotable about a vertical axis;

pivot means mounted on said swivel means and cantileverally mounting said retractable ramp for pivoting between a lowered position projecting over said loading station and an elevated position elevated above said swivel means and projecting upwardly adjacent said walkway;

ramp limit means mounted from said walkway for limiting downward travel of said ramp past said lowered position;

swing locater means mounted on said swing means and including a handle accessable from said ramp for actuating said locater means to lock said swing means in a selected position locating said ramp in a desired orientation over said loading station;

counterbalance means coupled with said ramp and said pivot means for counterbalancing said ramp to its elevated position;

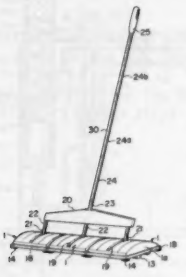
a ramp extension; and

slide means carrying said ramp extension from said ramp for selective extension thereof relative to said ramp whereby said car may be pulled into said location and a workman on said walkway may push the upper extremity of said ramp outwardly to pivot downwardly toward said lowered position and said workman may walk outwardly onto said ramp to weight it down to said lowered position, said ramp then swing to the desired angular location, said locater means activated to lock it there, and said extension then extended to extend said extension to the desired position over said locating station.

4,106,151
CARPET SWEEPER

Ray Cowdery, Burnsville, and Johan M. Larsen, Edina, both of Minn., assignors to Hukuba Kogyo Kabushiki Kaisha, Japan

Filed Feb. 10, 1977, Ser. No. 767,632
Claims priority, application Japan, Oct. 25, 1976, 51-143311[U]
Int. Cl.[2] A47L *11/32*
U.S. Cl. 15—42 5 Claims



1. A carpet sweeper comprising:

a plurality of sweeper units, each said sweeper unit comprising a frame cover having an arcuate top plate with a groove therein, a fitting rod resiliently supported to extend outwardly through said groove, cushion material surrounding and extending outwardly from the outer sides of said frame cover, a pair of dust receptacles, a rotary brush supported between said dust receptacles, driven roller means integral with said brush, and rolling wheels supported to be in contact with said driven roller means, such that as said sweeper unit is moved over a floor surface, said rolling wheels roll by contact with the floor surface and thereby drive said driven roller means and said rotary brush;

an intermediate member comprising a main body, a single arm extending outwardly from said main body in a first direction, a plurality, equal to the number of said sweeping units, of legs extending outwardly from said main body in a second direction, and said main body having thickened convex portions mechanically reinforcing said main body;

a handle comprising a plurality of elements adapted to be connected together to form an elongated handle having first and second ends, and a grip attached to said first end of said handle; and

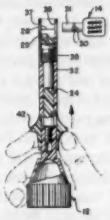
said plurality of sweeper units, said intermediate member, and said handle being removably assembled in a manner such that said plurality of sweeper units are aligned in side-by-side relationship with said cushion material of adjacent sweeping units in friction contact, each of said fitting rods are connected to a respective said leg of said intermediate member, and said arm is connected to said second end of said elongated handle.

4,106,152
TOOTHBRUSH

Joseph Hadary, 5405 Linden Ct., Bethesda, Md. 20014

Continuation-in-part of Ser. No. 674,438, Apr. 7, 1976, Pat. No. 4,033,007, which is a continuation-in-part of Ser. No. 564,074, Apr. 1, 1975, Pat. No. 3,994,039. This application Apr. 19, 1977, Ser. No. 788,938
Int. Cl.[2] A46B *9/10*
U.S. Cl. 15—172 10 Claims

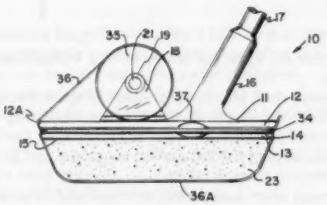
1. A toothbrush, comprising: an elongate handle means having opposite end portions, one of said end portions comprising a hollow, diametrically enlarged base capable of supporting the toothbrush in an upright position and of a size to receive and store a bristle head therein, the other end of the handle means including an elongate shaft fixed at one end thereof to one end of the base and extending axially therefrom; a sleeve telescopically received over the shaft and axially slidable relative thereto, said sleeve and shaft being approximately the same length; a bristle head adjustably carried by the handle means at said other end thereof and including a bristle head shaft projecting therefrom, said bristle head shaft extending at approximately a right angle to the axis of the handle means and releasably adjustably engaged with the handle means to support the bristle head in adjusted positions on the handle means; bristles on the bristle head extending in a direction mutually perpendicular to the axis of the handle means and the axis of the bristle head shaft; and a thumb engaging sleeve actuator axially slidable on the handle means for engaging and moving the sleeve axially to release the bristle head.



4,106,153
CLEANING APPLIANCE

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Continuation-in-part of Ser. No. 596,052, Jul. 15, 1975, abandoned. This application Mar. 25, 1977, Ser. No. 781,137
Int. Cl.[2] A47L *13/20*
U.S. Cl. 15—231 1 Claim



1. A cleaning and wiping appliance comprising:

a cleaning head having a substantially rectangular support having a base portion,

said base portion having a flat upper surface and circumscribing walls including front, rear, and connecting side walls formed of a rigid plastic material,

said side walls defining opposed edge portions,

a handle retaining means on said flat upper wall,

an elongated handle secured to said handle retaining means,

a flexible foam slab connected to the under surface of said base portion,

said flexible foam slab being confined within the perimeter defined by said circumscribing walls,

a pair of opposed brackets connected to said flat upper surface in opposed spaced apart relationship, said brackets extending upwardly above said upper surface, and

said brackets having bearing portions defined thereby,

a shaft means supported between the bearing portions of said brackets,

a roll of fiber reinforced absorbant paper supported on said shaft to permit the free end of said paper to be played out from said roll and threaded about said slab, said reinforced

paper including reinforcing fibers extending transversely and longitudinally of said paper to form an lattice reinforcement for said paper, said slab defining a resilient backing for said fiber reinforced paper, and said roll of paper being remotely disposed from the floor area to be cleaned, said brackets frictionally engaging the ends of said roll of paper for maintaining said paper tensioned,

retaining means to fixedly secure said fiber reinforced paper about said slab by clampingly engaging spaced apart portions of said fiber reinforced paper so as to retain said fiber reinforced paper in place over said slab when the cleaning head is disposed against a surface to be wiped or mopped with said fiber reinforced paper,

said retaining means including a circumscribing, rectangular frame member for snugly embracing said front and rear walls of said base portion whereby said fiber reinforced paper is clamped in position between said front and rear walls and said circumscribing member,

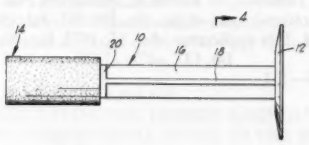
and means for releaseably securing said circumscribing member to said base portion whereby said member is displaced relative to said front and rear walls to facilitate the drawing of said fiber reinforced paper over said slab so that a clean section of said paper can be substituted for a preceeding soiled portion of said paper.

4,106,154

ADHESIVE APPLICATOR DEVICE

Charles W. Forsberg, Shaker Heights, Ohio, assignor to Indian Head Inc., New York, N.Y.

Filed May 13, 1976, Ser. No. 686,136
Int. Cl.[2] A47L *13/46;* **B05C** *17/00*
U.S. Cl. 15—244 R **4 Claims**



3. A device for applying adhesive to a cylindrical surface comprising:

an elongated shaft bifurcated at one end thereof and further including rearwardly directed barbs projecting into the bifurcation at said one end of the shaft with the barbs on opposite sides of the bifurcation staggered and in overlapping relation to each other;

an abutment plate interposed between said bifurcated end and the remaining portion of said shaft extending to the end thereof opposite said bifurcation, said abutment plate lying substantially in a plane extending normal to the axis of said shaft;

a handle integrally formed with the shaft on its end opposite its bifurcated end; and

a panduriform applicator pad retained in the bifurcation of the shaft and flaring out around the shaft adjacent said bifurcated end, said pad being impaled upon said barbs and abutting said abutment plate.

4,106,155

APPARATUS FOR WASHING CONTAMINATED LABORATORY CONTAINERS

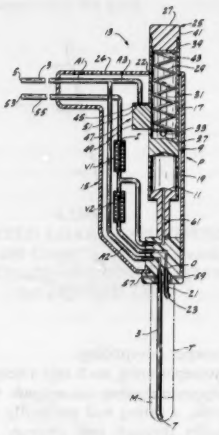
Egil Fosslien, Tampa, Fla., assignor to Cortex Research Corporation, Tampa, Fla.

Filed Oct. 6, 1976, Ser. No. 729,962
Int. Cl.[2] A74L *7/00;* **B08B** *9/08*
U.S. Cl. 15—321 **18 Claims**

1. Apparatus for washing contaminated laboratory containers such as test tubes, flasks and the like comprising:

a tube, one end of which is connected to a source of negative pressure and the other end of which is inserted into a contaminated container and having a length sufficient to reach the bottom thereof thereby to remove by aspiration created by said source of negative pressure material in the container;

a pump connected to a source of washing material and to said container and which, when actuated, delivers washing material from said sources into the container; and



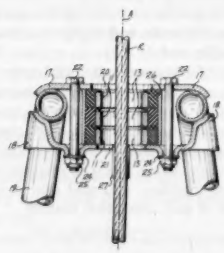
means responsive to actuation of said pump to interrupt said aspiration during delivery of washing material, said washing material thus delivered to the container and contaminants being withdrawn by aspiration from the container after the pump is deactuated.

4,106,156

SEGMENTED GUIDE EYE

Sidney L. Fisher, 3115 Mt. View Dr., and Harry S. Fisher, 14233 183rd Ave. SE., both of Renton, Wash. 98055

Continuation of Ser. No. 747,394, Dec. 3, 1976, abandoned. This application Aug. 22, 1977, Ser. No. 826,306
Int. Cl.[2] F16L *11/10*
U.S. Cl. 16—2 **8 Claims**



1. For use in an installation wherein a tensioned wire rope or the like may bend as it passes through a guide eye and in so doing will bear heavily against a side of the guide eye, an improved guide eye comprising:

a plurality of ring members, each having an axial length that is substantially smaller than its diameter, and each comprising a hard metal inner ring portion of stainless steel or the like and a concentric outer ring portion of elastomeric material; and

support means engaging said elastomeric material and holding said ring members in a stacked relationship with the open centers of the hard metal inner ring portions nor-

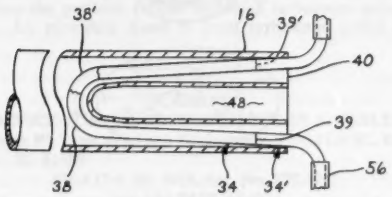
mally aligned, said support means permitting the elastomeric outer ring portions to distort when a tensioned wire rope or the like passing through the hole bears sideways against the hard metal inner ring portions, an amount sufficient to allow said hard metal inner ring portions to move angularly and make a generally rounded bent line contact with a tensioned wire rope or the like passing through the guide eye.

4,106,157

SWIMMING POOL SKIMMER AND THE LIKE

Thomas E. Baker, 4000 Davana Rd., Sherman Oaks, Calif. 91423

Filed Aug. 4, 1977, Ser. No. 821,769
Int. Cl.² B65D *25/28*
U.S. Cl. 16—112 **14 Claims**



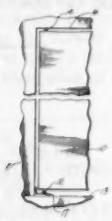
13. An appliance comprising:
a handle having at least one hollow end section, said handle being compressed along said one hollow end section to form a crimped wall and an opposing generally flat wall having an inner surface; and
a substantially non-resilient frame having a pair of U-shaped end sections extending laterally outwardly therefrom and disposed within said one hollow end section in mutually overlying relation upon one another with one of said U-shaped end sections lying against said inner surface of said flat wall, said frame being locked against movement within said handle by the compression of said handle against said U-shaped end sections.

4,106,158

ADJUSTABLE HEIGHT DOOR PIVOT

Kenneth K. Kellems, Costa Mesa, and Robert Brydolf, Pasadena, both of Calif., assignors to Acme General Corporation, San Dimas, Calif.

Division of Ser. No. 522,022, Nov. 8, 1974, abandoned. This application Jun. 21, 1976, Ser. No. 698,299
Int. Cl.² E05D *7/04*
U.S. Cl. 16—129 **18 Claims**



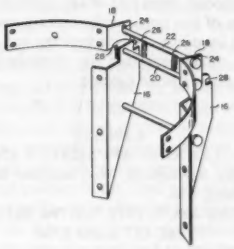
1. A lower pivot assembly for a swinging door comprising:
a jamb bracket connectable in the corner between a door jamb and the floor;
a slot along a portion of the jamb bracket parallel to the floor;
a plurality of serrations along each side of the slot extending laterally inwardly towards each other;
a sleeve connectable to the bottom of a door and having a female thread;
a threaded pin in the sleeve for adjusting door height by rotating the pin in the sleeve;
an enlarged, generally round, head integral with the lower end of the pin and having a lower portion narrower than the slot and an upper portion wider than the slot, at least the lower portion of said head having a plurality of splines extending in the same general direction as the length of the pin and complementary to the serrations along the edges of the slot so that when the splines on the enlarged head on the lower end of the pin engage the serrations along each edge of the slot both rotation of the pin about its axis and translation of the pin along the jamb bracket are prevented.

4,106,159

LATCHING HINGE FOR KILNS

Ronald Janney Cook, Dubuque, Iowa, assignor to Sybron Corporation, Rochester, N.Y.

Filed Aug. 1, 1977, Ser. No. 820,515
Int. Cl.² E05D *11/10*
U.S. Cl. 16—146 **1 Claim**



1. A latching hinge for retaining a kiln lid in an open position in relation to a kiln container, comprised of:
at least one bracket secured to said container;
at least one tab secured to said lid;
a pivot connecting said bracket and said tab while allowing rotation of said tab when said lid is being opened or closed;
said tab having a slot;
a latching rod retained by said slot;
at least one spring biasing said rod towards said bracket; and
said bracket having a notch along its periphery arranged so that when said lid is in an open position said latching rod engages said notch.

4,106,160

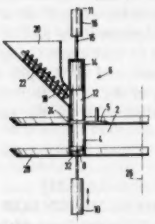
APPARATUS FOR VOLUME DOSING COMPRESSIBLE, LUMPY MATERIAL

Hans G. Jentsch, Daimlerstrasse 4, Essen 1, Fed. Rep. of Germany

Filed May 9, 1977, Ser. No. 795,221
Claims priority, application Fed. Rep. of Germany, May 11, 1976, 2620677
Int. Cl.² B05B *1/38;* B65B *63/02*
U.S. Cl. 17—32 **12 Claims**

1. Apparatus for the volume portioning of compressible, lumpy material, especially pieces of meat and prepared foods, said apparatus comprising a receiving apparatus with at least one passage opening of constant cross section which laterally defines a portioning chamber; a portioning piston with a cross sectional surface complementary to the cross section of the passage opening, which piston can be pushed into the portioning chamber at a first end, is displaceable axially and fixable in

at least one position within the latter in order to establish the volume of the portioning chamber formed in the passage opening; a filling apparatus disposed on the fill side of the receiving apparatus, opposite the portioning piston, said filling apparatus having a discharge orifice aligned with the second open end of the passage opening and one compressing piston displaceable coaxially to the portioning piston at least in the filling operation; a slot provided between the second opening end of the



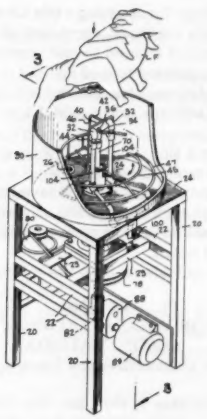
passage opening and the discharge aperture of the filling apparatus; a bladed cutting means which is mounted for movement transversely of the axis of movement of the two pistons and can be introduced into the slot such that it substantially snugly closes off the second open end of the passage opening; means for the ejection of the portioned material; and moving means which move at least one of the receiving and filling apparatus relative to the other such that the portioned material in the portioning chamber can be ejected.

4,106,161

POULTRY CLEANING APPARATUS AND METHOD

Paul L. Niccolls, Springfield, Mo., assignor to Empire Foods, Inc., Springfield, Mo.

Filed Jun. 3, 1977, Ser. No. 803,412
Int. Cl.[2] A22B *3/08*
U.S. Cl. 17—11 **20 Claims**



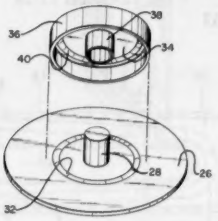
1. A poultry cavity washer comprising a source of pressurized water, a movable central nozzle means, side nozzle means respectively positioned adjacent said central nozzle means on opposite sides thereof, fowl supporting and positioning rack means positioned over sadi nozzle means dimensioned and shaped so that the surface of the abdominal cavity of a fowl positioned over said supporting and positioning rack means has the kidney area closely adjacent and facing said nozzle means, conduit means connecting said source of pressurized water to said nozzle means for providing pressurized water thereto and power drive means for moving said movable central nozzle means with respect to said side nozzle means for discharging a moving jet of water progressively across a portion of the surface of the abdominal cavity of a fowl on said supporting and positioning rack for washing and cleaning of the abdominal cavity of said fowl.

4,106,162

MOLD FOR FORMING A HAMBURGER PATTY

Herve L. Fournier, 95 Curtis Ave., South Attleboro, Mass. 02703

Filed Jun. 29, 1977, Ser. No. 810,911
Int. Cl.[2] A22C *7/00*
U.S. Cl. 17—32 **2 Claims**



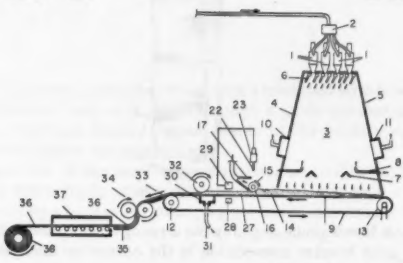
1. A mold for forming a hamburger patty comprising a lower mold member in the form of an annular flat disc of larger diameter than the desired patty, and an upper mold member comprising an annular disc of the same size as the desired patty, said upper disc having a depending wall portion, and telescoping means at the center of said members for guiding said members and for forming a large central opening in the patty, said telescoping means comprising a hollow member extending from the center of the surface of one of said mold members, and having a diameter ¼ to ½ the diameter of the upper disc, and a complementary solid member extending from the center of the surface of the other of said mold members, said solid member having an outer diameter slightly smaller than the inner diameter of said hollow member, said solid member being slidable into said hollow member to guide said mold members toward each other and to provide the meat patty with a large central opening and a doughnut shape.

4,106,163

APPARATUS FOR THE DRY PRODUCTION OF NON-WOVEN WEBS

Jean Desverchére, Lyons, France, assignor to Cefilac, Paris, France

Division of Ser. No. 653,665, Jan. 30, 1976. This application Jul. 28, 1976, Ser. No. 709,510
Claims priority, application France, Mar. 11, 1975, 75 08312
Int. Cl.[2] D04H *1/00*
U.S. Cl. 19—296 **12 Claims**



1. An apparatus for the dry production of non-woven uni-

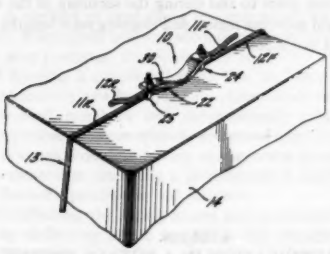
form webs comprising: first means for the formation of an initial aerated, homogeneous and isotropic layer of particles with more than 95% empty space, and second means for reducing the thickness of the layer while maintaining the homogeneous and isotropic nature thereof, said first means including a conveyor belt with a specific direction of movement, a particle discharge unit, and means below the discharge unit for distributing the particles from the discharge unit onto the conveyor belt at a vertical speed less than free fall speed and in a manner achieving isotropic orientation of the particles, said means for distributing the particles comprising a cowl having an upper end directly communicated with the particle discharge unit, and an enlarged lower end overlying the conveyor belt along a length of the conveyor belt, said cowl including a pair of walls spaced along the conveyor belt in the direction of movement thereof, said walls extending transversely of the conveyor and flaring outward relative to each other toward the lower end of the cowl, the inclination of the walls in relation to the horizontal being between 60° and 90°, said means for distributing the particles further including turbulence inducing means for providing zones of local turbulence within said cowl.

4,106,164

DEVICE FOR ABSORBING SHOCK IN A CABLE

Ellsworth W. Lapp, c/o Lapp Engineering, 6060 11th St., Rockford, Ill. 61109

Filed Oct. 26, 1976, Ser. No. 735,371
Int. Cl.[2] B65D *63/00*
U.S. Cl. 24—16 R **6 Claims**



1. A shock absorbing clamp for securing together the two end portions of a cable, said clamp comprising first and second U-bolts each adapted to receive the end portions of the cable, an elongated strap overlying the end portions of the cable and having first and second end portions formed with holes for receiving the legs of the respective U-bolts, said strap being made of resiliently yieldable material and having an intermediate portion which is bowed downwardly away from the end portions of the strap and toward the end portions of the cable, and nuts threaded onto the legs of said U- bolts above said strap for clamping the end portions of the cable between the U-bolts and the strap with the underside of the strap disposed in engagement with the cable, the bowed portion of said strap flexing upwardly when said cable is subjected to a high tensile shock load and enabling elongation of said cable when such shock load occurs.

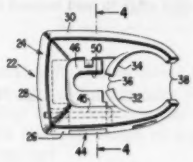
4,106,165

RETRACTABLE CORD GUIDING AND LOCKING DEVICES

Earl R. Clowers, Anderson, and John C. Davis, Greenwood, both of S.C., assignors to The Singer Company, New York, N.Y.

Filed Mar. 10, 1977, Ser. No. 776,154
Int. Cl.[2] F16G *11/00;* **A47L** *9/00*
U.S. Cl. 24—134 R **1 Claim**

1. A cord guiding and locking device for gripping and releasing a cord for an electrically actuated upright suction cleaner having an elongated tubular handle, a flexible electrical power cord with a plug, and a cord reel at the lower portion of the handle biased to retract the cord, said device comprising an integral hollow housing having side walls defining first and second internal cavities open at the top and bottom, said second cavity opening into said first cavity, the walls of a first of said cavities substantially conforming to the external contour of said handle for mounting thereon, means for securing said walls of said first cavity to the upper portion of said handle, means defining an opening in a wall of the second cavity, a locking member having first and second legs disposed angularly to one another, a first of said legs having a through slot therein of a size to allow the cord but not the plug to pass therethrough when the plane of the slot is substantially perpendicular thereto but to frictionally grip the cord when the plane



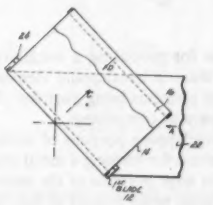
of the slot is not substantially perpendicular thereto, said slot being opened at one end facing said first cavity, means for pivotably mounting said member in the opening with said first leg positioned in the second cavity and said second leg accessible at the opening for depression by an operator, said cord being positioned in the slot intermediate the reel and the plug, stop means within said second cavity for restraining the first leg and the slot to substantial perpendicularity when the cord is being extended and when the second leg is depressed, whereby frictional contact of the cord with the sides of the slot upon retraction of said cord is effective to pivot the member to tilt the plane of the slot away from perpendicularity with the cord to frictionally grip the cord and to perpendicularly align the slot and the cord to release the cord upon extension of the cord and upon depression of the second leg.

4,106,166

METHOD FOR EXPANDING THE WIDTH OF PREFORMED FIBROUS WEBS

John C. Henning, Cincinnati, Ohio, assignor to The Stearns & Foster Company, Cincinnati, Ohio

Filed Mar. 10, 1976, Ser. No. 665,618
Int. Cl.[2] D04H *01/74*
U.S. Cl. 28—103 **10 Claims**



1. A method for expanding the width of a continuous length of preformed fibrous web comprising the steps of moving said web in a lengthwise direction, feeding said web to a blade edge, extending said web past said edge, at least a portion of said edge lying at an angle to said lengthwise direction, abruptly changing the direction of travel of said web at said edge from said lengthwise direction to a second direction, locking web fibers at said edge, turning web fibers in said second direction while expanding the width, controlling the uniformity of fiber orientation throughout the width of web

expansion, and taking said web having an expanded width off said edge in said second direction.

10. A method for expanding the width of a continuous length of preformed fibrous web having a predominant fiber orientation in the lengthwise direction comprising the steps of moving said web in said lengthwise direction feeding said web to a blade edge, extending said web past said edge, at least a portion of said edge lying at an angle to said lengthwise direction, abruptly changing the direction of travel of said web at said edge from said lengthwise direction to a second direction, locking web fibers at said edge, turning web fibers in said second direction to maintain said predominant fiber orientation in said lengthwise direction while expanding said width, controlling the uniformity of fiber orientation throughout the width of web expansion, and taking said web having an expanded width off said edge in said second direction.

4,106,167

FRICTIONAL METHOD AND MACHINE FOR SEAMING TUBULAR SECTIONS

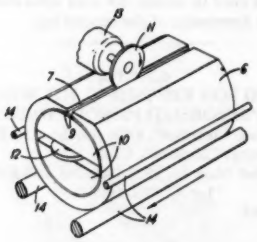
Penelope Jane Vesey Luc, 18, rue Fourcroy, Paris 17e, France

Division of Ser. No. 486,844, Jul. 9, 1974, Pat. No. 3,949,896, which is a continuation of Ser. No. 190,700, Oct. 20, 1971, abandoned, which is a continuation-in-part of Ser. No. 830,831, Jun. 5, 1969, abandoned. This application Oct. 30, 1975, Ser. No. 627,274

Claims priority, application United Kingdom, Oct. 23, 1970, 50494/70; Dec. 14, 1970, 59366/70

Int. Cl.[2] B21C *37/06*

U.S. Cl. 29—33 D **7 Claims**



1. An apparatus for producing a metallurgically homogenous continuous seam in overlapping elements formed from metal sheets of the elements being portions of a tubular metal container, the apparatus comprising:

(i) means for overlapping portions of metal sheet elements comprising means for forming a metal sheet into a tube in which parallel edge portions of the metal sheet elements overlap, the seam being formed at the overlap,

(ii) means for exerting sufficient pressure upon the overlapping elements to bring the interfacing surfaces of the elements into intimate contact,

(iii) means for subjecting an exposed portion of one of the elements adjacent to the interfacing surfaces to a frictional treatment comprising:

(a) a hard, smooth friction wheel and

(b) means for rotating said wheel at high speed while said wheel is in contact with the exposed portion; and

(iv) means for relatively traversing the overlapping portions of elements with the frictional treatment.

4,106,168

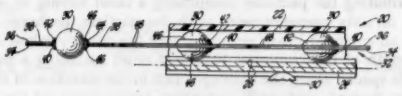
METHOD AND APPARATUS FOR ASSEMBLING A BALL CAGE OF THE TYPE UTILIZED IN A MOTION TRANSMITTING REMOTE CONTROL ASSEMBLY

William H. Parsons, Lansdale, Pa., assignor to Teleflex Incorporated, Limerick, Pa.

Filed Mar. 26, 1976, Ser. No. 670,750

Int. Cl.[2] B21D *53/12;* **B21H** *1/12;* **B23P** *21/00*

U.S. Cl. 29—148.4 C **41 Claims**



1. A method of assembling a ball cage of the type including a pair of coextensive strips having pocket portions defining ball retaining pockets having openings therein for rotatably retaining balls between the strips while exposing the balls and utilized in a conduit of a motion transmitting remote control assembly for facilitating the movement of a motion transmitting core element therein, said method comprising; simultaneously indexing the pair of strips successively through at least one station, forming the pocket portions in each of the strips, securing the strips together adjacent different ball retaining pockets with balls therein each time the strips are indexed, and longitudinally aligning the strips along the length thereof having the ball retaining pocket adjacent which the strips are secured together prior to and during the securing of the strips together by said securing means and aligning such lengths each time the strips are indexed.

4,106,169

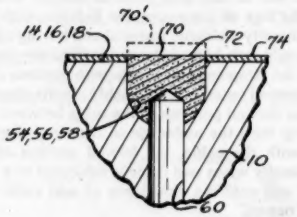
SEAL LUBRICATION IN A ROTARY ENGINE

Myron R. Gibson, Edelstein, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sep. 12, 1975, Ser. No. 612,600

Int. Cl.[2] B23P *15/00;* **F01C** *21/04*

U.S. Cl. 29—156.4 R **4 Claims**



1. A method of forming a lubrication outlet for lubricating a seal carried by a rotor in a rotary mechanism having a housing defining an operating chamber having a wall engaged by the seal, comprising the steps of

(a) forming a recess in the wall,

(b) filling the recess with an insert formed of sintered metal and of a size sufficient to extend into the operating chamber,

(c) securing the insert in the recess,

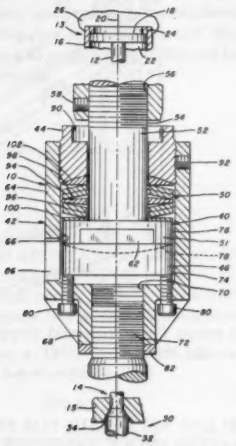
(d) hardening the wall, and

(e) finish machining the wall and the insert.

4,106,170
METHOD OF ASSEMBLING A COUPLING

E. Frederick Schoeneweis, Coraopolis, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Nov. 3, 1976, Ser. No. 738,634
Int. Cl.[2] B23P *15/00;* F16K *31/50*
U.S. Cl. 29—157.1 R 7 Claims



1. A method of applying a predetermined loading between axially translatable first and second members having individual axial stop positions, comprising the steps of:

(a) forming a coupling having first and second fittings respectively axially adjustably connectable to said first and second members and independently relatively axially movable between spaced surfaces of a lost motion connection, said coupling having spring means in said lost motion connection providing a predetermined loading when deflected a predetermined distance;

(b) deflecting the spring means said predetermined distance by deflecting means camed by and engaging one of the fittings;

(c) axially connecting one of the fittings to one of the members;

(d) axially connecting the other of the fittings to the other of the members;

(e) axially adjusting the fittings relative to the members to vary the distance therebetween until the members engage their respective stops positions and;

(f) further axially adjusting the fittings relative to the members to further vary the distance until the deflecting means disengages.

4,106,171
METHOD FOR CLOSURE OF HEAT PIPES AND DEVICE FABRICATED THEREBY

Algerd Basiulis, Redondo Beach, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Nov. 29, 1974, Ser. No. 528,173
Int. Cl.[2] B23P *15/26*
U.S. Cl. 29—157.3 R 10 Claims

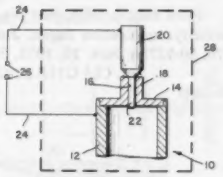
1. A method for closure of a heat pipe having a liquid metal working fluid therein comprising the steps of:

assembling means for defining the heat pipe and enclosure therefor, with the working fluid therein and with means for defining an opening in the heat pipe enclosure for having enabled placement of the working fluid therein;

inserting a plunger comprising the same material as that of the heat pipe enclosure into the opening means;

before or after said assembling and inserting steps, establishing an environment in the heat pipe and enclosure means in an atmosphere which is non-reactive with the liquid metal working fluid for assuring purity thereof;

heating the plunger and the heat pipe enclosure adjacent thereto to a temperature above the saturation temperature of the working fluid but below the melting point of the material of the heat pipe and the plunger while maintaining the environment for a time sufficient for evaporating



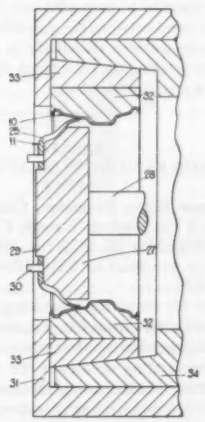
any of the working fluid from means for defining a gap between the plunger and the opening means, for preventing the working fluid from condensing across the gap means, and for allowing escape of any non-condensible gases therefrom; and

thereafter melting at least the plunger into the opening means while maintaining the environment for sealing the heat pipe enclosure and the working fluid therein.

4,106,172
VEHICLE WHEELS

William Harry Bache, Cookley, near Kidderminster, England, assignor to Steel Stampings Limited, England

Filed Apr. 5, 1977, Ser. No. 784,820
Claims priority, application United Kingdom, Apr. 7, 1976, 14041/76; May 15, 1976, 20178/76; Jun. 1, 1976, 22670/76
Int. Cl.[2] B23K *19/00;* B21H *1/10;* B21K *1/38*
U.S. Cl. 29—159.01 27 Claims



1. A method of producing a vehicle wheel constructed with at least two components to be friction welded together, the method comprising forming said components of the wheel separately, placing them in assembled relationship with respective surfaces thereon to be friction welded together in axial and radial proximity to one another, causing relative rotation between said components about an axis coincident with the axis of the finished wheel, maintaining at least said surfaces to be friction welded together against axial movement during rotation, creating concentric radial movement of one of the surfaces towards the other surface to bring them into contact to generate heating at these surfaces and then stopping the rela-

tive rotation of the components to produce a friction weld between the said surfaces.

4,106,173

METHOD OF MANUFACTURING MAGNETIC HEADS

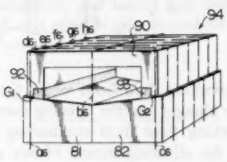
Tadashi Morokuma, Tokyo, and Naotsune Tsuda, Hachioji, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 4, 1976, Ser. No. 692,671

Claims priority, application Japan, Jun. 13, 1975, 50-71782; Jul. 30, 1975, 50-92736; Nov. 10, 1975, 50-135540

Int. Cl.[2] G11B *5/42*

U.S. Cl. 29—603 **10 Claims**



1. A method of manufacturing magnetic heads comprising the steps of providing a first core block piece having a pair of gap defining surfaces adjacent to its opposite sides, the gap defining surfaces being parallel to each other and projecting to different elevations, providing a second core block piece having a pair of gap defining surfaces which correspond to the gap defining surfaces of the first core block piece, disposing the first and second core block pieces in abutting relationship so that the associated gap defining surfaces are located opposite to each other, the differential elevations of the gap defining surfaces of the first core block piece causing the first core block piece to assume an inclined position, causing a molten gap forming material to permeate into a wedge-shaped clearance region formed between the gap defining surfaces, causing the gap forming material to solidify to provide a core block, and thereafter dividing the core block into a plurality of cores each having a predetermined size.

4,106,174

DEVICE FOR REMOVING MEAT HANGERS FROM MEAT

Laurence James Ilines, Edmonton, Canada, assignor to C.A. Pemberton & Co. Limited, Toronto, Canada

Filed May 25, 1977, Ser. No. 800,340

Int. Cl.[2] B23P *19/04*

U.S. Cl. 29—239 **10 Claims**

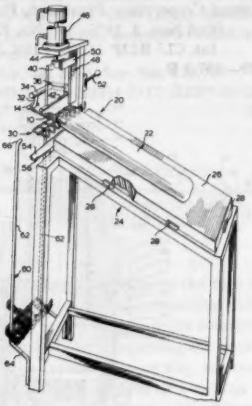
1. A device for removing meat hangers from meat such as bacon or the like, said meat hangers consisting of a body portion having a suspension hook at one end thereof and a plurality of meat penetrating needles at the other end thereof, the meat penetrating needles being inclined with respect to the body portion in a penetrating direction towards said suspension hook, said device comprising:

(a) a frame having a stripping station located therein,

(b) first support means at a first side of said stripping station for supporting a hanger,

(c) second support means at a second side of said station opposite said first side for supporting said body of meat with said hanger extending across said stripping station with its needles oriented in a first direction with respect to said stripping station,

(d) stripper means mounted for movement with respect to said frame to extend into said stripping between said first and second supports to engage said meat hanger and drive said needles in a second direction opposite said first direction to remove said needles from said meat in said second direction,



(e) drive means for driving said stripper member with respect to said frame.

4,106,175

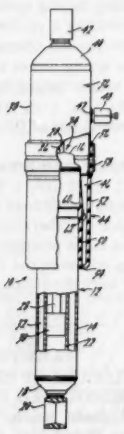
METHOD AND APPARATUS FOR MANUFACTURING COMBINATION SHOCK ABSORBERS AND LEVELING STRUTS

Robert R. Meyer, Monroe, Mich., assignor to Monroe Auto Equipment Company, Monroe, Mich.

Division of Ser. No. 424,294, Dec. 13, 1973, Pat. No. 3,967,363. This application Mar. 22, 1976, Ser. No. 668,916

Int. Cl.[2] B23P *19/08*

U.S. Cl. 29—243.52 **5 Claims**



1. In the assembly of a combination shock absorber-leveling unit of the type including a shock absorber having a piston and piston rod supported for reciprocal movement in a body member, a dirt shield connected to the piston rod and a diaphragm defining a flexible partition between the body member and the dirt shield, an apparatus for crimping a clamping ring premounted to the diaphragm comprising:

a support structure for coaxially and axially supporting the clamping ring, diaphragm and portion of the shock absorber unit to which the ring and diaphragm are to be attached;

a plurality of crimping dies supported by said structure, each of said dies having a first position spaced a preselected

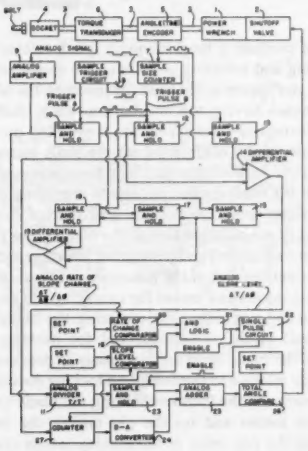
distance from said clamping ring and a second clamping position, each of said dies having a concave-shaped working face, the faces substantially fully encircling the ring when said dies are in said second position; and

actuating means including roller means guidably supporting a portion of said combination unit for displacing each of said dies from said first position to said second position wherein said faces compressively circumferentially engage said clamping ring and whereby said diaphragm is fixedly secured to said portion of said unit and in fluidtight engagement therewith.

4,106,176
METHOD AND APPARATUS FOR FASTENER TENSIONING

Edwin Eugene Rice, Ann Arbor, Mich., and Walter Carl Vliet, Landing, N.J., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Apr. 6, 1977, Ser. No. 785,026
Int. Cl.² B23Q *5/00*
U.S. Cl. 29—407 **21 Claims**



1. A method of fastener tensioning in a joint system comprising:

rotating the fastener;

monitoring a tension-related function applied to the fastener and a function of rotation applied to the fastener;

determining the rate of change of the tension-related function per unit of the function of rotation;

determining when the rate of change of the tension-related function per unit of the function of rotation becomes a constant;

determining the constant rate;

determining a starting point for rotation based on a linear projection of the constant rate determined and an instantaneous value of the tension-related function, said starting point corresponding to the zero value of the tension-related function intercept of the function of rotation;

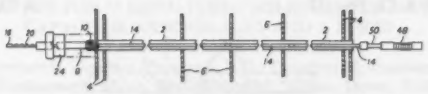
rotating the fastener a proportionally determined amount of rotation from said starting point; and

stopping the rotation of the fastener in response to the fastener being rotated the proportionally determined amount.

4,106,177
METHOD OF WITHDRAWING ELONGATE TUBULAR MEMBERS

James Henry Beard; Cyril Lea, and Bernard William Ludwig, all of Melton Mowbray, England

Filed Jan. 23, 1976, Ser. No. 651,811
Claims priority, application United Kingdom, Jan. 24, 1975, 3106/75; Aug. 24, 1975, 34891/75; Aug. 23, 1975, 35110/75; Jan. 24, 1975, 3107/75
Int. Cl.² B23P *19/02*
U.S. Cl. 29—427 **7 Claims**

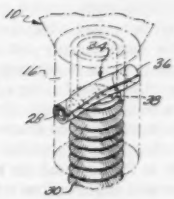


1. Apparatus for withdrawing an elongated tubular member from a bore in a support member, said apparatus comprising an adapter means having means for fixedly securing the same on a leading end portion only of the tubular member so as to form an extension thereof, and gripping means for initially gripping said adapter means and effecting pulling of said adapter means therethrough and the the tubular member in an axial direction through the bore in the support member, said gripping means including means for gripping both said adapter means and the tubular member in sequence to continue the pulling of the tubular member through said gripping means after said adapter means has passed through said gripping means.

4,106,178
THREADED STUD DRIVING TOOL

James P. Seletyn, P.O. Box 207, Scarbro, W. Va. 25917

Filed Dec. 10, 1976, Ser. No. 749,382
Int. Cl.² B25B *13/50*
U.S. Cl. 29—428 **11 Claims**



11. A method of using an internally threaded stud driving tool having a resilient abutment bar provided therein so as to extend across the threaded portion for driving threaded studs into holes comprising the steps of:

inserting one end of the threaded stud within the drive tool until the drive end surface of the stud engages the resilient bar;

inserting the other end of the stud into the hole;

applying a driving torque to the drive tool sufficient to drive the stud into the hole and simultaneously bending the resilient bar so that it bends along its length thereby changing the degree of contact between the drive end surface of the stud and the resilient abutment with contact being greater at the periphery than at the center of the drive end surface so that oppositely positioned inclined shoulders are formed in the end wall of the stud along which the resilient bar moves;

disengaging the resilient abutment from the drive end surface of the driven stud by applying torque to the drive coupling in a direction opposite to the driving torque thereby allowing the resilient bar to return to its original undeformed condition while simultaneously sliding in an opposite direction along the inclined shoulders so that the

drive coupling can be removed from the stud without back rotating the driven stud.

4,106,179

METHOD OF COLD-JOINING METAL PARTS

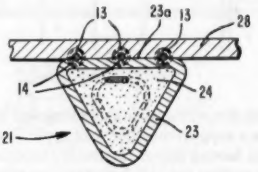
Richard Bleckmann, Imbergstrasse 24, Salzburg, Austria

Continuation-in-part of Ser. No. 487,633, Jul. 11, 1974, Pat. No. 4,008,845. This application Sep. 30, 1976, Ser. No. 728,060

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1973, 2336149

Int. Cl.[2] B23P *11/00*

U.S. Cl. 29—432 **24 Claims**



1. A method of cold-joining metal parts together comprising the steps of, providing two metal parts having contact surfaces, providing at least one insert comprising a wire coil having a predetermined pitch in accordance with the material of said metal parts and said wire coil and said wire coil having a hardness greater than the hardness of the metal of both of said metal parts, positioning said insert between said metal parts with oppositely disposed portions of said insert in engagement with the contact surface on said metal parts, moving said metal parts together with said insert therebetween and compressing said metal parts together to cause the metal of said metal parts to flow around the associated portions of said insert for anchoring said insert to said metal parts with said contact surfaces in abutting engagement and with said metal parts in a securely bonded relationship.

22. A method of cold-joining metal portions together comprising the steps of, providing a metal sheet having a tubular configuration with longitudinally extending edge portions, arranging said edge portions in adjacent relationship, providing at least one insert of metal having a hardness greater than the hardness of the metal sheet, positioning said insert between said edge portions in sandwiched relationship therewith, and compressing said edge portions together to cause the metal of said edge portions to flow around the associated portions of said insert to secure said edge portions together with said insert therebetween and anchored therein to thereby form said sheet into a tubular conduit.

4,106,180

METHOD AND APPARATUS FOR RIVETING

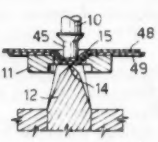
Ralph Fuhrmeister, Tarragindi, Australia, assignor to Furma Manufacturing Co. Pty. Ltd., Coopers Plains, Australia

Filed Apr. 18, 1977, Ser. No. 788,645

Claims priority, application Australia, Apr. 20, 1976, PC5632

Int. Cl.[2] B21J *15/04;* **B23P** *11/00*

U.S. Cl. 29—432.1 **3 Claims**



1. A method of riveting metal pieces including the steps of: driving a rivet to deform parts of said pieces into a female die having a greater diameter than a shank portion of the rivet for engagement of the pieces with a cutter in the die;

continuing the forward movement of the rivet through the die causing the cutter to cut a plurality of cuts radiating from a point through the pieces; and

further driving the rivet and punching a hole centered on said point through the pieces with the radiating cuts therein for urging the penetrating end of the rivet shank to be cut into a number of sections by the cutter, and causing said sections to be spread apart by the cutter.

4,106,181

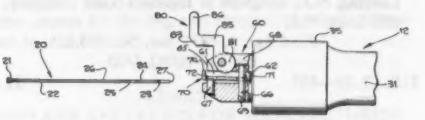
QUICK RELEASE MECHANISM FOR OSCILLATING SAW BLADE

Terry M. Mattchen, Van Nuys, Calif., assignor to American Safety Equipment Corporation, Encino, Calif.

Filed Aug. 9, 1976, Ser. No. 712,730

Int. Cl.[2] B23P *11/02;* **A61B** *17/14*

U.S. Cl. 29—450 R **19 Claims**



1. In an oscillating head having a quick release mechanism for securing and releasing a blade to the oscillating head, and including slot means in the head for inserting the blade therein, the slot means having top and bottom walls, shaft means extending through the slot means for preventing movement of a rear portion of the blade adjacent the shaft means in a plane parallel to the oscillations, the blade having means for cooperating with the shaft means, pin means extending partially into the slot means from the bottom wall thereof for preventing movement of a central portion of the blade in the plane coincident to the oscillations and permitting insertion and removal of the blade over the end of the pin means into and out of the slot means, cam means and means for mounting the cam means for rotation in the slot means for camming the blade against the bottom wall of the slot means and for moving the central portion of the blade onto the pin means to prevent movement of the blade relative to the head, and locking means for locking the cam means in the location holding the blade to the bottom of the slot means and on the pin means, the improvement comprising the provision of the locking means comprising:

stop means on the head for stopping rotation of the cam means to prevent rotation of the cam means beyond a certain point, and means for mounting the stop means such that when the stop means intersects the cam means, the line of force on the cam means is directed to one side of the axis of rotation of the cam means to urge the cam means against the stop means.

4,106,182

METHOD OF MANUFACTURING AN OILWELL SWAB CUP

Henry Wayne Blackwell, Venus, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Dec. 27, 1976, Ser. No. 754,705

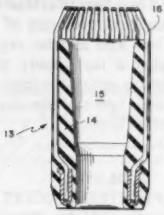
Int. Cl.[2] B23P *3/00, 19/04*

U.S. Cl. 29—460 **8 Claims**

8. A method of forming an oil well swab cup bushing, said method comprising:

locating vertical arm means in an annular unitary base means having two concentric vertical wall sections;

securing said arm means between said concentric vertical wall sections in tightly secured relationship; and,



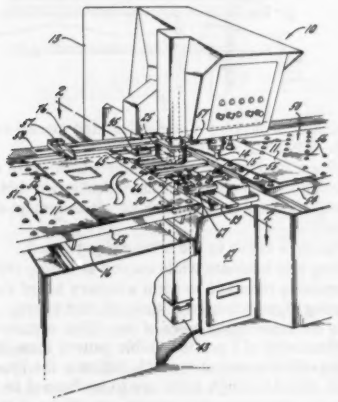
molding an elastomeric body to said vertical arm means and said annular unitary base means.

4,106,183

COMBINED PUNCH PRESS AND CUTTING TORCH WITH WORKPIECE SUPPORTING MEANS

Theodore F. Brolund, Rockford; William B. Scott, Rochelle, and Merle R. Pauley, Rockford, all of Ill., assignors to W. A. Whitney Corp., Rockford, Ill.

Filed Dec. 27, 1976, Ser. No. 754,826
Int. Cl.[2] B27P *23/06;* **B26B** *7/06;* **B23S** *3/00*
U.S. Cl. 29—564 **3 Claims**



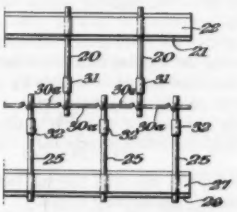
1. A punch press comprising a frame and a vertically reciprocable punch, a die on said frame in underlying relation with said punch and adapted to coact with said punch to form a hole in an intervening workpiece when said punch is advanced downwardly, a metal cutting tool mounted in a horizontally stationary position on said frame in transversely spaced relation with said punch and operable to emit downwardly directed energy for melting said workpiece, an upright duct on said frame beneath said workpiece and alined with said tool whereby molten metal from said workpiece is directed downwardly into said duct, a table for supporting said workpiece and movable back and forth in a fore-and-aft direction on said frame to locate said workpiece in various fore-and-aft positions beneath said punch and said tool, said table being formed by a first section located on one side of said die and said duct and by a conjointly movable second section located on the opposite side of said die and said duct, there being a fore-and-aft extending throat between said table sections to permit said table to move forwardly to positions in which said table sections straddle said die and said duct, first and second platforms each having an upper surface for supporting said workpiece, each of said platforms being disposed between said table sections and located within said throat in at least some positions of said table, said first platform being located rearwardly of said die and said duct, said second platform being located between said die and said duct, abutment means on the rear portion of said table and successively engageable with said first and second platforms as said table is moved forwardly, and means mounting each platform on said frame for movement relative to said table and said frame and permitting each platform to move out of the way of said abutment means when said platform is engaged by said abutment means.

4,106,184

METHOD FOR MAKING FUSED SOLID ELECTROLYTE CAPACITOR ASSEMBLAGES AND A FUSED CAPACITOR MADE THEREBY

Lawrence E. Fournier, Penacook, N.H.; Theodore M. Jasiewicz, Westborough, Mass., and William M. Milton, Dover, N.H., assignors to Sprague Electric Company, North Adams, Mass.

Filed May 16, 1977, Ser. No. 797,204
Int. Cl.[2] B01J *17/00*
U.S. Cl. 29—570 **16 Claims**



1. A method for making fused solid electrolyte capacitor assemblages comprising holding at regular intervals a plurality of solid electrolyte capacitor bodies by their anode leads; holding at said regular intervals one group of mutually parallel cathode lead wires, each lead wire being held at one end portion thereof; placing a continuous bi-metallic exothermically alloyable fuse strand over the other end portions of said lead wires so as to intersect each of said lead wires; forming a joint at each of said intersections; cutting said fuse strand in each space between the adjacent of said joints so that a segment of said fuse strand extends from each of said lead wires, respectively; registering said held group of cathode lead wires with said held plurality of capacitor bodies so that said other end portion of each lead wire lies adjacent to one of said bodies; providing an insulative layer between each of said bodies and said adjacent lead wire; and connecting the free end of each of said fuse segments to the cathode counterelectrode of the adjacent of said bodies, respectively.

4,106,185

MOTOR MANUFACTURING METHOD, SYSTEM AND METHOD, SYSTEM AND COMPONENTS

Richard E. Lauer, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Filed Jun. 13, 1977, Ser. No. 805,701
Int. Cl.[2] H02K *15/06*
U.S. Cl. 29—596 **23 Claims**

1. A method of fabricating winding turns on a dynamoelectric machine magnetic core having a bore therein and a plurality of axially extending winding turn accommodating core slots, the method comprising:

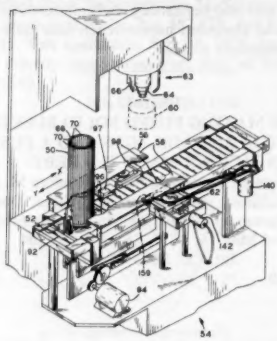
supporting coil injection tooling with winding turns thereon and the magnetic core on transporting means at a first location;

moving the transporting means with the winding turns, injection tooling, and core supported thereon to a second location;

transferring the injection tooling with the winding turns

thereon from the transporting means to a coil injection machine;

aligning the magnetic core with the previously transferred injection tooling and relatively moving the injection tooling and core so that at least part of the injection tooling protrudes into the bore of the core;



transferring the winding turns from the injection tooling into turn accommodating core slots by moving winding turn portions axially along such slots;

relatively moving the injection tooling and core whereby the injection tooling is removed from the bore of the core; and

transferring the injection tooling from the coil injection machine to transporting means.

4,106,186

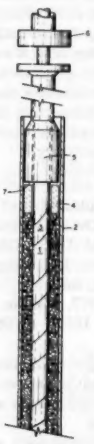
BORON NITRIDE INSULATING MATERIAL

Chester S. Morgan, Jr., Oak Ridge; O. Burl Cavin, Knoxville; Reginald W. McCulloch, Concord, all of Tenn., and David L. Clark, Clearwater, Fla., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 24, 1976, Ser. No. 744,494

Int. Cl.[2] H01C *1/03*

U.S. Cl. 29—616 **11 Claims**



1. A method for fabricating an electric heater comprising a cylindrical housing and a concentric heating element disposed within said housing and spaced apart from said housing to define an annular region therebetween, said annular region containing boron nitride for providing electrical resistance and thermal conductivity between said housing and said heating element, said fabrication method comprising the steps of:

(a) cold pressing boron nitride powder at a pressure of 20–80,000 psig and a dwell time of at least 0.1–3 seconds to provide hollow cylindrical preforms of suitable dimensions for insertion into said annular region, said boron nitride powder having a tap density of about 0.6–1.1 g/cm^3 and an orientation ratio of at least about 100/3.5;

(b) inserting said preforms into said annular region; and

(c) crushing said preforms in place.

4,106,187

CURVED RIGID PRINTED CIRCUIT BOARDS

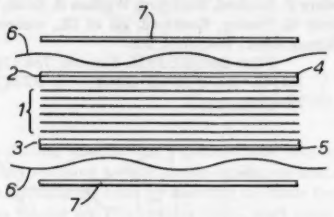
Brian Roger Smith, Bicknacre; Charles Richard Jarvis, Hockley; Stephen Martin Payne, Chelmsford; Robert John Potts, Maldon, and Frank Wallis, Chelmsford, all of England, assignors to The Marconi Company Limited, England

Filed Jan. 16, 1976, Ser. No. 649,673

Claims priority, application United Kingdom, Jan. 18, 1975, 2264/75

Int. Cl.[2] H05K *3/06*

U.S. Cl. 29—625 **9 Claims**



1. A method of making a curved printed circuit board including the following sequence of steps:

(a) placing a flexible glass cloth impregnated with uncured or partially cured epoxide resin between two thin flexible lamina, the outer face of each of which lamina carries a copper foil;

(b) imparting a curve to the laminate so formed;

(c) hea' ıg said laminate while curved as in step (b) to cure said epoxide resin and to form a unitary board thereby;

(d) forming registration holes through said board;

(e) using the registration holes of step (d) to permit registration therewith of a printed visible pattern formed on one surface of the board and which indicates the locations at which plated-through holes are to be formed to provide electrical connection between the two faces of the board and then forming holes at said locations; and

(f) selectively removing regions of said copper foils to produce desired printed circuits on both surfaces of said board and in registration with each other.

4,106,188

TRANSISTOR COOLING BY HEAT PIPES

Kalwant S. Sekhon, Fullerton; Lloyd A. Nelson, Villa Park, and John E. Fritz, Jr., Anaheim, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Division of Ser. No. 678,336, Apr. 19, 1976, Pat. No. 4,047,198. This application Jul. 1, 1977, Ser. No. 812,038

Int. Cl.[2] H01B *19/00*

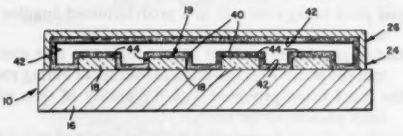
U.S. Cl. 29—631 **7 Claims**

1. A method for fabricating a microelectronic package capable of operating with power densities extending at least to 10 kW/cm^2 comprising the steps of:

fabricating means for defining electronic devices and circuitry and a sealed enclosure therefor, with leads extending from the electronic devices and circuitry to connection points on the exterior of the enclosure;

adhering dielectric powder to substantially all interior sur-

faces of the enclosure and to substantially all exposed surfaces of the electronic devices and circuitry for defining a heat pipe wick substantially completely and conformally coating the interior and exposed surfaces; and



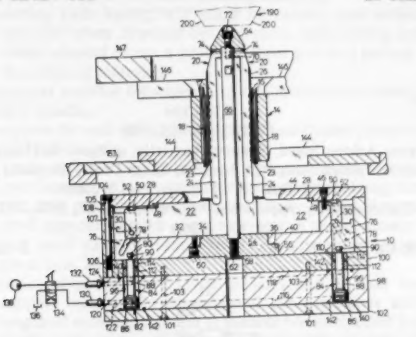
inserting dielectric working fluid into the enclosure for intimate contact with all of the interior and exposed surfaces, thereby for minimizing the occurrence of local hot spots on the electronic devices and circuitry and for maximizing heat transfer therefrom to an external heat sink.

4,106,189

STATOR COIL PRESS

Robert W. Peters, 9036 N. 75th St., Milwaukee, Wis. 53233

Filed Feb. 28, 1977, Ser. No. 772,764
Int. Cl.² H02K *15/06*
U.S. Cl. 29—736 **20 Claims**



1. A stator coil forming device for forming the coils in the slots of a stator, said device comprising:

a slide plate,

a plurality of coil setting blades supported for radial movement on said slide plate,

and means for independently moving each of said blades radially outwardly, at least two of said blades moving different distances, to press the coils into the slots of the stator.

4,106,190

HAIR CLIPPER

Edmund Maurice Buras, Jr., Silver Spring, and Allan Carl Harper, Gaithersburg, both of Md., assignors to The Gillette Company, Boston, Mass.

Filed Dec. 13, 1976, Ser. No. 750,211
Int. Cl.² B26B *19/20*
U.S. Cl. 30—43.7 **8 Claims**

1. A hair clipper comprising:

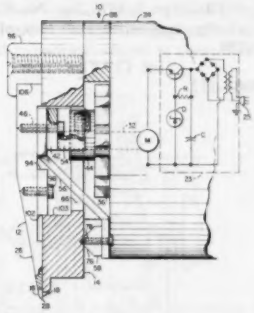
a housing;

a first cutter having a plurality of teeth;

a second cutter having a plurality of teeth, said second cutter being assembled between said housing and said first cutter with said first cutter teeth projecting beyond said second cutter teeth;

means for flexibly holding said first cutter against said second cutter including a spring member having one end connected to said first cutter and means for slidably coupling a spring member end opposite said one end to a slot in said second cutter; and

means for reciprocally moving said first cutter teeth against



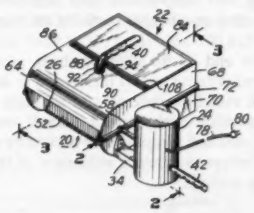
a skin surface and against said second cutter in a lateral direction substantially parallel to extreme edges of said second cutter teeth for raising hairs for cutting between said first and second cutter teeth.

4,106,191

COMBINATION HEDGE TRIMMER AND CLIPPINGS COLLECTOR

Larry A. Haralambou, 299 Horseblock Rd., Farmingville, N.Y. 11738

Filed Jun. 6, 1977, Ser. No. 803,550
Int. Cl.² B26B *19/38*
U.S. Cl. 30—132 **17 Claims**



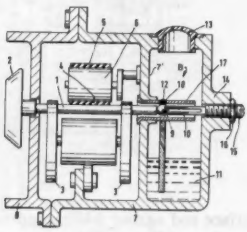
1. A combination hedge trimmer and clippings collector which comprises a substantially linear hedge trimmer, said hedge trimmer consisting essentially of a plurality of juxtaposed blades together with means to reciprocate said blades, so that said blades are movable relative to stationary vegetation whereby at least a portion of the vegetation may be severed from connection to ground, a generally cylindrical brush means, the central axis of said brush means being substantially parallel to said hedge trimmer, means to rotate said brush means about said central axis, a baffle, one edge of said baffle being juxtaposed with said hedge trimmer, said baffle being disposed about a portion of the circular path of motion of the terminal ends of said brush means so that said terminal ends are contiguous with said baffle during a portion of the rotation of said brush means, an enclosure about and extending from the terminus of said baffle, so that said severed portion of the vegetation is directed by said brush means to a disposition first adjacent to and then contiguous with said baffle and thereafter said severed portion of the vegetation is discharged by said brush means from juxtaposition with said baffle and into said enclosure, means to periodically remove severed portions of the vegetation from said enclosure, and means to manipulate said hedge trimmer so that said plurality of juxtaposed blades are brought in contact with further portions of stationary vegetation.

4,106,192

SHAFT BEARING ARRANGEMENT

Fritz Stahlecker, Josef-Neidhart-Str. 18, D-7341 Bad Überkingen, assignor to Fritz Stahlecker and Hans Stahlecker, Germany

Filed Apr. 5, 1976, Ser. No. 673,521
Claims priority, application Fed. Rep. of Germany, Apr. 4, 1975, 2514734
Int. Cl.[2] F16C *1/24*
U.S. Cl. 308—172 41 Claims



1. A bearing arrangement for a shaft connected to a spinning turbine of an open-end spinning unit, the arrangement comprising:

a ball means,

an oscillatable holding means for freely rotatably holding said ball means in an abutting relationship with an end of the shaft, said holding means extending generally in the direction of the shaft rotational axis,

means for fixedly clamping only a first end of said holding means to a relatively fixed member, and

accommodating means provided at a free end of said holding means, opposite said first end, for at least partially accommodating said ball means, said accommodating means being formed as a socket partially encompassing the ball means,

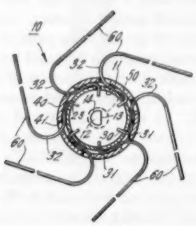
wherein the end of the shaft abutting said ball means is configured without socket means and in such a manner as to permit radial displacement of said ball means from its central position with respect to said end of the shaft, whereby said ball means can be moved by said oscillatable holding means to enhance utilization of the ball means as a bearing surface.

4,106,193

ROTARY SCRAPER WITH NON-GOUGING FINGER ARRAY

Leonard Fisher, 42 Spriteview Ave., Westport, Conn. 06880, and James E. Richardson, 28 Ladder Hill Rd., Weston, Conn. 06883

Filed Apr. 27, 1977, Ser. No. 791,307
Int. Cl.[2] A47L *13/08;* A22C *25/02*
U.S. Cl. 30—172 7 Claims



1. A rotary scraper comprising a spool and a shaft said spool being secured to said shaft

a plurality of sets of relatively flat fingers secured to said spool and extending radially therefrom

said sets of fingers being substantially parallel to each other and being spaced radially about said spool;

each set of fingers extending in a region parallel to said axis of said shaft;

said shaft being rotatable in a predetermined angular direction;

said fingers being inclined in said region so that their ends trail the points of connection to said spool during rotation;

the spool being provided with a plurality of slots substantially parallel to the shaft;

the base of each finger being received in one of said slots and being held therein;

a cover member being secured over said spool;

said cover member having a plurality of slots equal to the number of slots in said spool and displaced circumferentially from said spool slots;

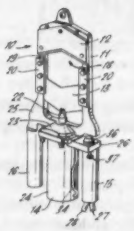
each finger having a base section entering a spool slot, a section extending substantially circumferentially of said spool and a section bent out radially into and through the corresponding cover slot.

4,106,194

CUTTING MEANS

Trevor Ashton Steed, Sydney, Australia, assignor to Harry M. Miller Attractions Pty. Limited, Kings Cross, Australia

Filed Feb. 28, 1977, Ser. No. 772,826
Claims priority, application Australia, Feb. 27, 1976, 5021/76
Int. Cl.[2] B26B *15/00*
U.S. Cl. 30—228 3 Claims

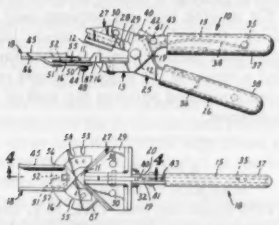


2. Cutting means comprising a frame; a pair of opposed blades mounted on the frame; one of the blades being movable relative to the other between an open position in which cutting edges on the blades are spaced apart and a closed position in which the said edges are juxtaposed; a hydraulic or pneumatic double acting ram mounted on the frame and adapted, when connected to a hydraulic or pneumatic power source, to effect movement of the said movable blade between the open and closed positions; and a pair of handles on the frame, one of the handles containing longitudinally extending hydraulic or pneumatic fluid and inlet and outlet ducts being rotatable within a bore in the frame to selectively direct hydraulic or pneumatic fluid from the inlet duct to the ram to either move the movable blade to or away from the closed position, the handle being so positioned relative to the frame that when only the said one handle is held by an operator the weight of the cutting means will cause it to rotate relative to the handle until the hydraulic or pneumatic fluid from the inlet duct is directed to the ram to move the movable blade to the open position.

4,106,195
HAND TOOL FOR CUTTING AND FORMING AESTHETIC ENDS ON DECORATIVE MOLDING

Jack V. Berg, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed May 23, 1977, Ser. No. 799,200
Int. Cl.[2] B26B *29/00*
U.S. Cl. 30—293 1 Claim



1. A hand tool for cutting preformed continuous flexible strips of decorative molding material and forming terminal leading and trailing ends on the cut strips, said tool comprising

an anvil support member having a support surface shaped to support a surface of said molding material,

a cutting knife having a V-shape for cutting said molding material when disposed on said anvil, said cutting knife being adapted to cut a predetermined notched pattern in the molding material,

a support member for supporting said anvil and including a first handle,

a support for said knife including a second handle pivoted to said first handle,

a guide member comprising an elongate channel-shaped member adapted to support a length of said molding material, said guide member being pivotally mounted to said anvil support member about a pivot axis perpendicular to said anvil support surface to afford adjustment about a pivot axis, and

indexing means on said guide member and on said anvil support member for placing said guide member and a length of molding material at various predetermined fixed positions on said anvil surface in relationship to said knife said indexing means including two notches formed in the anvil support surface, one notch positioned on a line bisecting the V-shape of said blade and the other at ninety degrees with respect to said one notch to form a symmetrical cut on the molding material and an insert, pairs of notches to the right hand and left hand sides of said anvil support surface and said one notch at symmetrical locations for cutting left and right hand pointed leading ends from the molding material and the mating inserts, and

pins means on said pivoted guide member spaced from said pivot axis to be received in a selected one of said notches for accurately locating said molding material with respect to said V-shaped blade.

4,106,196
COIN WRAPPER CUTTING DEVICE

John P. Smithline, Columbia, Md., assignor to Pacific Handy Cutter, Inc., Costa Mesa, Calif.

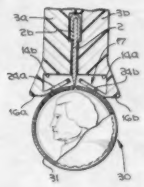
Filed May 5, 1977, Ser. No. 794,001
Int. Cl.[2] B26B *29/00;* B25F *3/00*
U.S. Cl. 30—294 2 Claims

1. A cutting device for longitudinally slitting generally cylindrical objects comprising the provision of:

body means for supporting a cutting element;

alignment means for positioning said cutting element relative to said body means such that said cutting element projects beyond and in a plane perpendicular to a bottom surface of said body means;

bearing shoulder means comprising shoulder elements formed integral of said body means parallel to, on each side of, and offset from said projecting cutting element for longitudinally aligning a cylindrical object with respect to said cutting element, positioning said object such that a surface thereof contacts said cutting element and supporting said cylindrical object relative to said cutting element such that protrusion of said cutting element through said surface of said cylindrical object is controlled and any



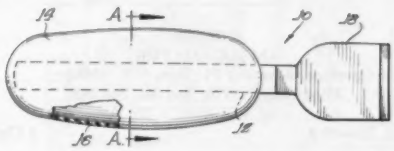
slitting of said cylindrical body by said cutting element is generally along the longitudinal extent of said cylindrical body; and

protective means comprising thin flexible sheet-like members extending from said bearing shoulder means to said plane of said cutting element and parallel to and spaced from said bottom surface of said body means a distance at least equal to the distance said cutting element projects beyond said bottom surface.

4,106,197
ICE CREAM SPOON

Charles E. Russell, 5N343 Powis Rd., Wayne, Ill. 60184

Filed May 5, 1977, Ser. No. 793,823
Int. Cl.[2] A47J *43/28*
U.S. Cl. 30—324 1 Claim



1. An ice cream spoon, particularly for rapidly and effortlessly cutting serving portions from a block of hard frozen ice cream, comprising

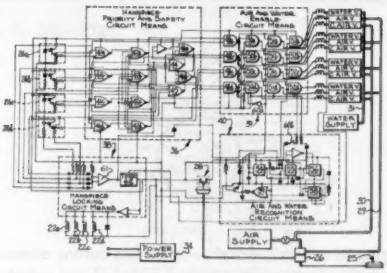
a. a blade or scoop member of stainless steel,

b. an elongate shaft or tang member of stainless steel extending outwardly from said blade member and forming with the same a solid unit of highly heat-conducting characteristics throughout all sections thereof,

c. a handle made from a lightweight material of high heat accumulating capacity, surrounding said shaft member and being rigidly and securely attached thereto in free heat-conducting relationship therewith, said handle being of maximum size for convenient gripping with one hand, and

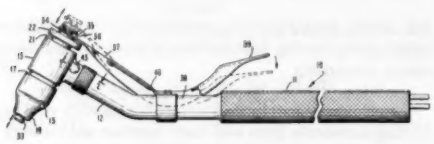
d. a thin heat-insulating layer hermetically enclosing said handle to protect the user's hand from excessive heat, whereby the entire spoon may be briefly immersed in a hot water bath and thereby heated, with a great proportion of the heat stored in said handle material for subsequent conduction to said blade portion of the spoon upon removal of the spoon from said hot water bath.

4,106,198
CONTROL ARRANGEMENT FOR HANDPIECE INSTRUMENT
Bobby Belton Childress, Charlotte, N.C., assignor to Pelton & Crane Company, Charlotte, N.C.
Filed Nov. 12, 1976, Ser. No. 741,385
Int. Cl.[2] A61C *19/02*
U.S. Cl. 32—22 **12 Claims**



8. In an apparatus having a plurality of instrument handpieces, console means for receiving the plurality of handpieces, flexible hose means respectively attached to the handpieces and extensible from the console means upon selection and removal of corresponding ones of the plurality of handpieces from the console means, detector means for sensing the removal of each handpiece from the console means, supply means for selectively delivering at least one of a plurality of fluids through the flexible hose means to each of the plurality of handpieces, and foot controller means actuatable for governing the delivery of fluid to the handpieces; the combination therewith of a control apparatus comprising: means operatively connected with and responsive to the detector means and the foot controller means and operatively connected with the supply means (a) for identifying a handpiece which has been selected by an operator and removed from the console for use, (b) for distinguishing among varying patterns of actuation of the foot controller means indicative of selection of certain fluid for delivery, and (c) for enabling delivery of selected fluid to a selected handpiece only.

4,106,199
AMALGAMATOR
Carmine Gaccione, John Jay Pl., Rye, N.Y. 10580
Filed Dec. 6, 1976, Ser. No. 748,065
Int. Cl.[2] A61C *5/06*
U.S. Cl. 32—40 A **3 Claims**



1. A dental amalgam triturating and dispensing tool which comprises:

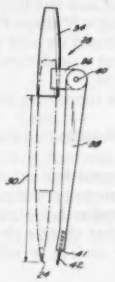
a housing member including means defining a bore extending transversely through said member and having an opening therefrom on one side of said member,

an amalgamator receptacle defining a closed chamber, said receptacle being slidably positioned in said bore and adapted for reciprocating movement therein with an end portion of said receptacle exposed through said opening of said bore, and a restricted passageway communicating with said chamber interior extending through said end portion of said receptacle,

valve means including a pin having a tamping-head portion at one end thereof, said pin being mounted in said chamber for reciprocating movement between a first position with said tamping-head portion extending outwardly of said chamber through said passageway thereby sealing said passageway and projecting therebeyond and a second position with said tamping-head portion withdrawn into said chamber, thereby permitting communication between said chamber and the exterior of said receptacle through said passageway,

drive means in said member for reciprocating said amalgamator receptacle through a limited distance in said bore, and means for moving said pin between said first and second positions thereof, said drive means including a cam, rotatable shaft means in said member for rotating said cam, and a recess in the exterior of said receptacle, said cam being positioned adjacent the wall of said bore engaging said recess.

4,106,200
MARKER COMPASS
David Maxwell, 6035 Broadway, New York, N.Y. 10471
Continuation-in-part of Ser. No. 654,210, Feb. 2, 1976, abandoned. This application Mar. 7, 1977, Ser. No. 774,751
Int. Cl.[2] B43L *9/20, 9/24*
U.S. Cl. 33—27 B **2 Claims**



1. A marker compass assembly comprising:

A leg of fixed length, a resilient plastic cross-arm pivotally mounted to one end of the leg with a limited amount of frictional interengagement therebetween so that they retain their respective positions unless subjected to a predetermined amount of force, means at the other end of the leg to facilitate positioning of the leg at a desired location on a surface to be marked, a resilient plastic retainer/cap affixed to the end of the cross-arm distal from the leg and having a closed end and a tapered recess in the other end, the surfaces forming the recess having a larger diameter at the point distal from the closed end and gradually tapering toward the closed end, the retainer/cap having a generally cylindrical external configuration and dimensionally conforming to the shape and size of a cap for a conventional size, hand-held, desktype writing marker, the cross-arm due to its resilience can be coupled with a variety of different size conventional retainer/caps without alteration in structure of the cross-arm or the retainer/caps, a conventional size, hand-held, desk-type writing marker body of fixed length and generally cylindrical configuration containing marking material subject to relatively rapid evaporation, the marker body having a closed end and a writing tip at the other end, the marker body requiring substantially zero force to accomplish the writing function when the tip is applied to the writing force, the marker body being reversably mounted in the recess of the retainer/cap and having tapered surfaces on both ends of the marker body generally conforming to the tapered recess to permit tight frictional interengagement therebetween, whereupon insertion of the closed end of the

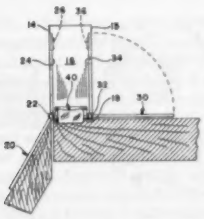
marker body into the recess will produce automatic retention of the marker body in position for use as part of the marker compass with the writing tip exposed and in fixed position for use and, reversal of the marker body and insertion of the writing tip into the retainer/cap will produce automatic retention of the marker body in position for sealing protection of the writing tip when not in use to avoid evaporation of the marking material without the necessity of an additional protective cap, the leg having a predetermined length corresponding to the length of the marker body when the marker body is held in the retainer/cap with the tip exposed so that when the leg is positioned at the desired location on the writing surface the marker tip will be in position to write on the surface and application of the predetermined amount of force to pivot the cross-arm will permit adjustment of the marker tip relative to the positioned end of the leg on the surface thereby determining the radius of the arc that is to be drawn, and a limited amount of frictional interengagement being adequate to retain the relative pivotal position of the marker body with respect to the leg during rotation of the marker compass since no force need be applied to the marker tip for writing purposes during use.

4,106,201

TAPE MEASURE

Owen P. Hansen, 1200 Grand Ave., #4, Spring Valley, Calif. 92077

Filed Apr. 13, 1977, Ser. No. 786,972
Int. Cl.² B43L *7/00*; G01B *3/10*
U.S. Cl. 33—75 R **9 Claims**



1. An improved tape measure comprising:

a casing having a retractable measuring tape coiled therein;

said casing comprising a front wall, two side walls, and a bottom wall;

carpenter's square blade means pivotally secured to said casing at the intersection of said bottom wall and one of said side walls, the axis about which said blade means pivot extending substantially along the length of the edge of the casing that is formed by the intersection of said bottom wall and one of said side walls;

said carpenter's square blade means being pivotally moveable into and out of engagement with at least one of said side walls whereby a line can easily be scribed perpendicular to the longitudinal axis of said measuring tape by running a marking instrument along the forward edge of said carpenter's square blade means on the surface to be scribed.

4,106,202

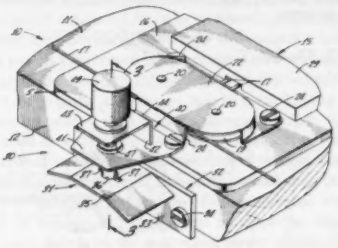
APPARATUS FOR INDICATING THE ANGLE OF A DRAFTING PARALLEL

Joseph W. James, 501 W. Whiting, Fullerton, Calif. 92632

Filed Nov. 8, 1977, Ser. No. 849,680
Int. Cl.² B43L *13/02*
U.S. Cl. 33—80 **7 Claims**

1. Apparatus for use with a drafting board and a drafting parallel of the type including a straight edge suspended by cables on one surface of said board for parallel movement therealong, comprising:

means for releasably locking one end of said straight edge in a fixed position relative to said drafting board so as to permit pivotable movement only of said straight edge; and



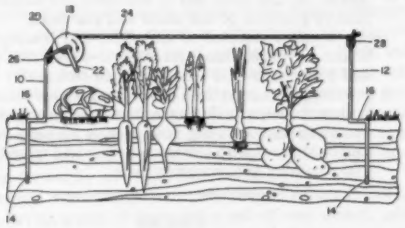
an angle scale connectable to said board adjacent the other end of said straight edge for indicating the amount of angular rotation of said straight edge.

4,106,203

GARDEN ROW MARKER

William J. Sikma, 307 S. Line St., and Ronald J. Pease, 707 Jeffery Ct., both of Columbia City, Ind. 46725

Filed Sep. 16, 1977, Ser. No. 833,741
Int. Cl.² B43L *7/00*
U.S. Cl. 33—86 **8 Claims**



1. A garden row marker comprising:

(a) a supply of marking cord,

(b) a pair of stakes having pointed lower ends for inserting into the ground,

(c) a reel rotatably attached to the upper end of one of said stakes for storing said cord thereon,

(d) means for securing the free end of said cord to the upper portion of the other of said stakes,

(e) a reversing roll provided on the upper end of said one stake positioned beneath said reel, said roll adapted to permit the free end of said cord to pass downwardly from said reel and around said roll, back up to said reel for engagement with the remaining cord supply on said reel, and finally to the securing means on said other stake,

whereby the cord may be unwound from said reel to define a straight line of a desired length between said pair of stakes, said reel being secured against further unwinding by said engagement between the unwound portion of said cord and said remaining supply on said reel.

4,106,204
DUAL READOUT DIAL-TYPE CALIPER

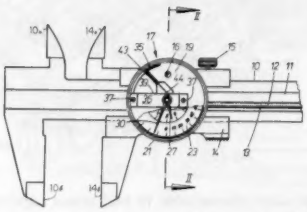
Karl Schäder, Niedernhall-Giebelheide Fed. Rep. of Germany, assignor to Schneider & Kern, Niedernhall, Fed. Rep. of Germany

Filed Jun. 3, 1977, Ser. No. 803,418

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1976, 2625976

Int. Cl.[2] G01B *3/20, 5/02*

U.S. Cl. 33—147 T **19 Claims**



1. A caliper comprising:
an elongated beam provided with at least one longitudinally extending rack;
a slider displaceable longitudinally along said beam;
a mechanism holder pivoted on said slider about a transverse pivot axis and having front and rear sides forming respective front and rear journals together defining an arbor axis generally parallel to and offset from said pivot axis;
an arbor rotatable in said journals about said arbor axis and having front and rear ends projecting respectively from said front and rear sides of said holder;
a pinion on said rear end meshing with said rack, whereby displacement of said slider along said beam rotates said arbor;
indicator means including a scale carried on said slider and a pointer on said front end of said arbor for indicating the relative positions of said slider and said beam;
spring means connected to said slider and bearing on said holder for urging same pivotally in a direction pressing said pinion into tight mesh with said rack; and
a mounting plate carrying a pin defining said pivot axis, said indicator means including a back plate formed with a throughgoing mounting hole at least partially receiving said holder and with a recess adjacent said mounting hold and receiving said mounting plate.

4,106,205
APPARATUS FOR MEASURING INSIDE AND OUTSIDE CHAMFERS ON WORKPIECES

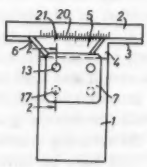
Hans Wiederkehr, Ifangstrasse 107, Rumlang, Switzerland

Filed Jun. 3, 1976, Ser. No. 692,437

Claims priority, application Switzerland, Jun. 13, 1975, 7698/75

Int. Cl.[2] G01B *3/56*

U.S. Cl. 33—174 E **5 Claims**



1. An apparatus for measuring inside and outside chamfers on workpieces, said apparatus comprising:
a substantially flat rectangular body having a first stop edge along one side thereof and at least one guide slot formed in said body and opening into said first stop edge;
a measuring tongue having a single second stop edge on one end thereof slideably mounted within said guide slot with said second stop edge arranged to protrude through said first stop edge a distance depending upon the position of said measuring tongue in said guide slot, said second stop edge being inclined with respect to the direction of motion of said tongue in said guide slot to also form an angle with said first stop edge generally corresponding to the angle of the chamfer to be measured;
means for releasably securing said measuring tongue to said body within said guide slot; and
an arm extending outwardly from said one side of said body forming an angle of substantially 90° with said first stop edge where, by movement of said tongue, said second stop edge forms an angle between both said arm and said first stop edge, said arm being formed with a third stop edge defining one side of the angle between said arm and said first stop edge on said body.

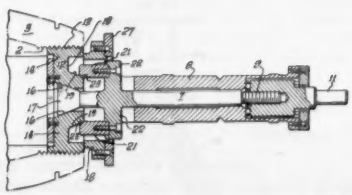
4,106,206
POSITIVELY EXPANDABLE AND RETRACTABLE THREAD MEASURING GAGE

Otto W. Piehl, deceased, late of Corona Del Mar, Calif., by Julia A. Piehl, legal representative, assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 25, 1977, Ser. No. 790,739

Int. Cl.[2] G01B *5/16*

U.S. Cl. 33—199 R **5 Claims**



1. A positively expandable and retractable thread-measuring gage apparatus comprising:
an elongate housing member provided with an axial bore,
an elongate shaft member reciprocably mounted in said bore and having a forwardly disposed driving end,
means for reciprocably moving said shaft member axially in said bore,
a first inclined-surface cam means carried by said driving end of the shaft member,
a second inclined-surface cam means also carried by said shaft member in a position disposed radially outwardly of and in close proximity to said first cam means, and
a cam follower member carried by said housing, said member being formed of a plurality of segments extending radially outwardly of said housing bore with each having a first inclined surface slidably engaging the inclined surface of one of said cam means and a second inclined surface disposed radially outwardly of said first inclined surface in slidable engagement with the inclined surface of the other cam means, said slidable engagements being disposed in diametrical opposition for supporting said segments and for exerting radially opposite forces on said segments to the extent that when said shaft is moved in one axial direction one of said engagements radially expands said followers while the other permits said expansion and when the shaft is moved in the other direction the other engagement contracts the followers with said one engagement permitting the retraction,
each of said radially extending segments having an arcuate

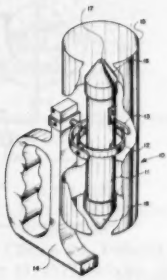
portion provided with threads matching said threads to be measured, said arcuate portions geometrically forming a circle whereby said gage can be disposed with its threaded segments radially aligned with the threads to be measured and its shaft member moved in opposite directions for expanding and contracting the threaded segments into and out of contact with said threads.

4,106,207

POINT TO POINT SELF-LEVELING PLUMBING DEVICE

Vernon Hugo Boyett, 310 Lakeshire Dr., Daly City, Calif. 94015, and Robert W. Devine, 743 Montezuma Dr., Pacifica, Calif. 94044

Filed Aug. 9, 1976, Ser. No. 712,868
Int. Cl.[2] G01C *15/02, 15/10*
U.S. Cl. 33—286 **5 Claims**



1. A point to point, self-leveling plumbing device comprising: a stand, an elongated hollow body having opposed open ends mounted on said stand, said stand including means forming a handle for holding said body at various distances above and below a first and a second surface, respectively, said distances including distances which may require focusing of either or both of said upper and said lower light beams with respect to said first and second surfaces, a gimbal system mounted on the stand and disposed within said hollow body, an elongated, pendulous housing suspended on the stand by the gimbal system, the housing having axially aligned openings at its upper and lower ends in general proximity to said opposed ends, said stand being shaped and configured to support said hollow body in a generally vertical orientation on a horizontal surface, means disposed within the housing for emitting an upper and a lower light through the aligned openings such that the upper light beam is aligned with the lower light beam, means for individually adjustably focusing said upper and lower light beams with respect to said first and second surfaces; and said hollow body defining on one side thereof a smooth, uninterrupted surface capable of making at least line contact with a planar surface.

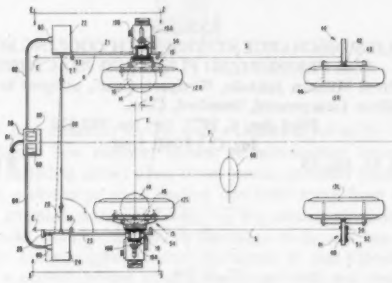
4,106,208

METHOD OF AND APPARATUS FOR DETERMINING VEHICLE WHEEL ALIGNMENT

Lee Hunter, 13501 Ladue Rd., Ladue, Mo. 63141

Filed Apr. 9, 1976, Ser. No. 675,347
Int. Cl.[2] G01B *07/315, 19/295, 11/275*
U.S. Cl. 33—288 **5 Claims**

3. Vehicle wheel alignment determining apparatus for vehicles having at least four wheels arranged in sets spaced apart longitudinally of the vehicle and the wheels of each set being on opposite sides of a common longitudinal center line for the vehicle and from which alignment is to be determined, said apparatus comprising: elongated support means connected to each of a first set of wheels in a position to be parallel with the plane of wheel rotation and to project beyond the wheel perimeter to an outer end; electrically operable wheel position monitoring means mounted on each of said elongated support means in positions adjacent the outer ends so as to be beyond said first set of wheels, said monitoring means including movable elements operatively interconnected so as to be automatically and simultaneously responsive to a change in the angular alignment position of the plane of rotation of said first set of wheels relative to the vehicle center line; means for moving one of the monitoring means forwardly and rearwardly on its elongated support means while each monitoring means continues to monitor the position of the wheel with which it is associated; target means positioned adjacent each of a second set of wheels so as to be spaced longitudinally of the vehicle from said first set of wheels, said target means each having alignment measuring scales with indicia thereon; target sighting means mounted on each of said elongated support means connected to an associated one of said first set of wheels, and each having a line of sight fixed so as to be substantially and continually parallel to the plane of rotation of the associated wheel of said first set of wheels and in position to view the alignment measuring scale indicia on the associated target means adjacent to the second set of wheels, each target sighting means being movable with its associated wheel to follow a change in the angular alignment position of said first set of wheels, whereby



said alignment measuring scale indicia on said target means are viewed by said sighting means in determining the straight ahead alignment characteristics of said first set of wheels; and display means located remote from said elongated support means and monitoring means and being connected to said monitoring means to continuously display the response of each monitoring means as angular alignment adjustments are made on the first set of wheels and also as said one monitoring means is moved forwardly and rearwardly on its support means.

5. Vehicle wheel alignment determining apparatus for a vehicle having a pair of front and a pair of rear wheels, said apparatus comprising: target means disposed adjacent the faces of each of a first pair of vehicle wheels, said target means having similar scale indicia thereon presented to face toward the second pair of vehicle wheels; sighting means carried by each of said second pair of vehicle wheels in parallel to the plane thereof and directed to scan said scale indicia on the associated target means and align with selected indicia on said target means; and computer means operatively carried by one of said target means to combine the selected indicia and automatically indicate the value of the average of said selected indicia.

4,106,209

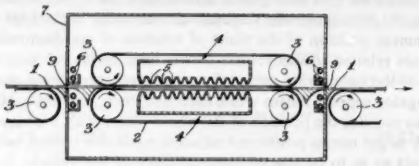
DRYING VENEER WITH JETS OF SUPERHEATED SOLVENT VAPOR

Frederick L. Brown, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Apr. 21, 1977, Ser. No. 789,386
Int. Cl.[2] F26B *3/04*
U.S. Cl. 34—9.5 **9 Claims**

1. A process for drying a green veneer sheet which comprises contacting at least one surface of said sheet with multiple

spaced jets of the superheated vapor of a water-immiscible organic liquid, recovering the vapor of said liquid after contacting the veneer sheet, and recycling the recovered vapor to the process.

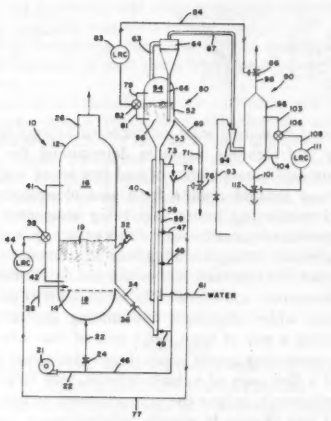


4,106,210

SOLIDS DISCHARGE SYSTEM WITH COOLING MEANS FOR PRESSURIZED FLUID BED REACTORS

Walfred Wilhelm Jukkola, Westport, Conn., assignor to Dorr-Oliver Incorporated, Stamford, Conn.

Filed Jan. 6, 1977, Ser. No. 757,430
Int. Cl.² F26B *3/08*
U.S. Cl. 34—10 **8 Claims**



8. A process for continuously discharging hot particulate solids from a pressurized fluid bed reactor to cool and depressurize said solids comprising:

a. elevating particulate solids discharged from a first pressurized fluidized bed in a fluidized column to a level substantially above said first pressurized fluidized bed to effect a first increment of depressurization,

b. disposing said elevated particulate solids in a secondary pressurized fludized bed operating at a substantially lower pressure than that of said first pressurized bed to effect additional cooling,

c. establishing a plug of solids of predetermined length for discharge from said secondary pressurized fluidized bed,

d. permitting continuous gas flow through said plug and

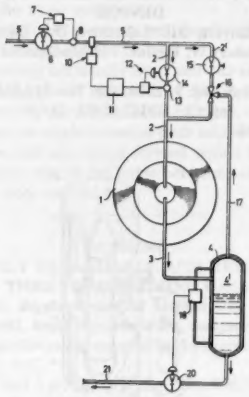
e. continuously discharging solids from said plug at an inhibited rate to maintain said plug length and thereby depressurize said solids to essentially ambient pressure.

4,106,211

APPARATUS FOR OPERATING A DRYING CYLINDER OF A PAPER MAKING MACHINE

Herbert Holik, Ravensburg, Germany, assignor to Escher Wyss GmbH, Ravensburg, Germany

Filed May 5, 1976, Ser. No. 683,426
Claims priority, application Switzerland, Jun. 17, 1975, 7806/75
Int. Cl.² F26B *11/04*
U.S. Cl. 34—48 **4 Claims**



1. The combination of

a drying cylinder for a paper making machine,

supply means for delivering a supply of steam to the interior of said drying cylinder,

a quantity measuring means for determining the amount of steam being supplied to said drying cylinder per unit of time and for emitting a measurement signal in response thereto,

a pressure-regulating means for regulating the pressure prevailing in said drying cylinder, and

a signal-emitter for receiving said measurement signal from said quantity-measuring means for transmitting a control signal to said pressure-regulating means as a function of said measurement signal of said quantity-measuring means to vary the pressure of the steam delivered to said drying cylinder.

4,106,212

GRAIN DRYER SIDEWALL CONSTRUCTION AND METHOD OF DRYING GRAIN

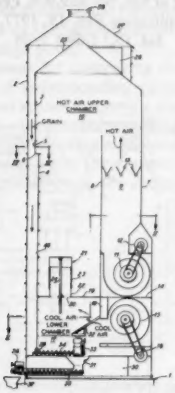
Elmo L. Batterton, and Melvin J. Lonsdale, both of Morton, Ill., assignors to Meyer Morton Co., Morton, Ill.

Filed Jul. 14, 1976, Ser. No. 705,159
Int. Cl.² F26B *19/00*
U.S. Cl. 34—65 **6 Claims**

1. A continuous flow grain dryer of the upright type having a pair of spaced inner and outer walls having perforations therein and defining a path for the flow of grain therebetween with partition means defining the space in the inner wall into a hot air upper chamber and a cool air lower chamber, and means to supply hot air to the upper chamber and cool air to the lower chamber with means to control the admission of cool air through said partition into the lower portion of said upper chamber, wherein the improvement comprises:

the upper part of the inner wall defining a greater interior transverse area than the lower part of said wall, and trans-

verse means connecting the two parts of said inner wall to provide a grain path of constant width above said transverse means, and a grain path of greater constant width below said transverse means.



4,106,213

EXHAUST RECIRCULATION SYSTEM FOR CLOTHES DRYER

Earl L. Witte, Rte. 6, Clinton Rd., Paducah, Ky. 42001

Filed Apr. 11, 1977, Ser. No. 786,621
Int. Cl.[2] F26B *21/08*
U.S. Cl. 34—79 **6 Claims**

1. A device adapted to be attached to an exhaust vent pipe of a clothes dryer for recirculating exhausted air within a room, comprising:

a length of tubing formed with a substantially right angled bend, one end of said tubing having a circular cross section and a diameter substantially equal to the diameter of said vent pipe for mounting to said vent pipe, the opposite end of said tubing extending parallel to an outer surface of the clothes dryer and adapted to be located adjacent an upstanding wall;

a filter bag;

means for releasably securing said filter bag on said opposite end of said tubing;

said filter bag being adapted to extend outwardly between the dryer and the wall, said opposite end of said tubing having an approximately elliptical cross section with the major axis thereof oriented parallel to said wall,

said filter bag having a circumference approximately equal to the circumference of said opposite end of said tubing, thereby enabling said dryer to be positioned closely adjacent said wall; and

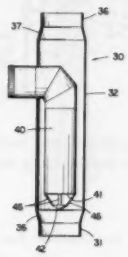
means for supporting said device on said dryer vent pipe.

4,106,214

DRYER ATTACHMENT

Robert H. Schmidt, 6223 E. 56th St., Indianapolis, Ind. 46226

Continuation-in-part of Ser. No. 593,759, Jul. 7, 1975, abandoned. This application Jul. 19, 1976, Ser. No. 706,681
Int. Cl.[2] F26B *19/00*
U.S. Cl. 34—86 **9 Claims**



1. A heat reclaimer for use with a clothes dryer of the type including a heat chamber means, an intermediate chamber means including rotary drum dryer means, an outlet chamber means, a discharge stack leading upwardly away from said outlet chamber means, and a blower for moving air through said outlet chamber means and discharge stack, said heat reclaimer comprising a conduit positioned at and extending along a central section of said discharge stack and leading through the wall of said stack and adapted to be coupled into said upper heat chamber means, said stack having an enlarged diameter at the conduit-containing portion of said stack;

in a combination in which the heat reclaimer conduit has at its upstream end a downwardly pointing conical deflector, which directs the air to the outer wall so that lint and moisture carried in the discharge stack air upstream will bypass the said reclaimer conduit rather than re-cycle back through the reclaimer;

and in which the heat reclaimer conduit has its downwardly pointing conical deflector located in the region of the discharge stack in which the diameter thereof increases to its said enlarged diameter.

4,106,215

WOOD IMPINGEMENT DRYER

Howard N. Rosen, Carbondale, Ill., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jul. 14, 1976, Ser. No. 705,230
Int. Cl.[2] F26B *19/00, 25/06*
U.S. Cl. 34—217 **5 Claims**

1. An apparatus for the continuous drying and seasoning of lumber comprising:

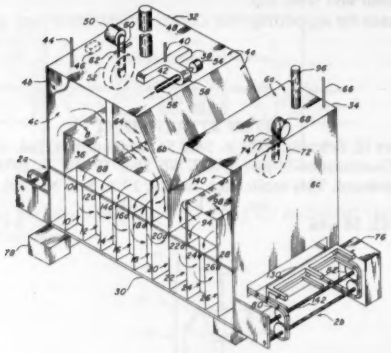
an elongated drying section,

an elongated steam condition section sequentially communicating with said drying section,

a housing structure encompassing said drying section and said steam conditioning section,

means for continuous transportation of lumber longitudinally and sequentially through said drying and steam conditioning sections,

means for the impingement of hot air onto lumber being transported through said drying section,



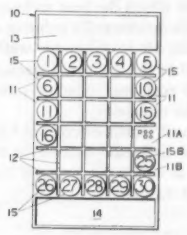
means for impinging steam onto lumber being transported through said steam conditioning section.

4,106,216

POSITIONING SYSTEM UTILIZING BINARY CODE

Edward A. Boehm, Apt. #1, 2361 Ecuadorian Way, Clearwater, Fla. 33515

Filed Feb. 16, 1977, Ser. No. 769,396
Int. Cl.[2] G09B *1/10*
U.S. Cl. 35—9 R **8 Claims**



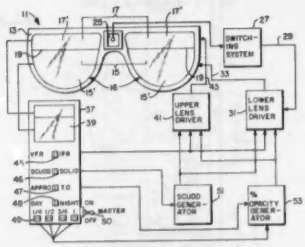
1. A positioning system utilizing a binary type code including in combination, a base having a plurality of first coupling portions each having one of a first configuration representing a binary "0" digit of the code and a second different configuration representing a binary "1" digit, and a member adapted to be coupled to said base and having a plurality of second coupling portions, each having one of a first configuration representing a binary "0" digit and a second different configuration representing a binary "1" digit, said second coupling portions which have said first configuration being shaped to couple only with one of said first coupling portions which have said first configuration, and said second coupling portions which have said second configuration being shaped to couple only with one of said first coupling portions which have said second configuration, said second coupling portions of said member representing a given binary number and mating with said first coupling portions of said base which represent the same binary number.

4,106,217

HEAD MOUNTED FLIGHT TRAINING APPARATUS

Frank A. Witt, Rte. #4, Hidden Acres, Lexington, S.C. 29072

Continuation-in-part of Ser. No. 659,906, Feb. 20, 1976, Pat. No. 4,021,935. This application Feb. 15, 1977, Ser. No. 768,941
Int. Cl.[2] G09B *9/08*
U.S. Cl. 35—12 B **15 Claims**



12. Flight training apparatus operable for affecting a pilot's vision out through the windshield of his aricraft, comprising:

voltage controlled lens means having a first state of transparency permitting visual communication therethrough and operable to a second state of percentage opacity for affecting visual communication, said second state of percentage opacity for simulating distance of visibility to the pilot;

means for suitably securing said lens means in a transverse relationship with respect to lines of sight of a pilot;

vision checking means for checking the pilot's vision through said lens means with respect to a peripheral-view-direction to a predetermined line of sight to engage movement of the pilot's head for a greater peripheral viewing along said peripheral-view-direction;

means for monitoring the relative position of said predetermined line of sight with respect to the windshield, said means indicating when said predetermined line of sight passes through said windshield; and

electrical circuitry means cooperable with said monitoring means for actuating said lens means to said second state responsive to said monitoring means indicating said predetermined line of sight is passing through said windshield, said lens means otherwise remaining in said first state, whereby a flight training apparatus is provided operable to affect the pilot's visual communication when the pilot views outside the craft to simulate distance of visibility, and operable to unobstructed clear visual communication as the pilot turns to view the instrument control panel of his craft.

4,106,218

SIMULATOR METHOD AND APPARATUS FOR PRACTICING THE MATING OF AN OBSERVER-CONTROLLED OBJECT WITH A TARGET

Walter K. Polstorff, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation-in-part of Ser. No. 590,183, Jun. 25, 1975, abandoned. This application Feb. 25, 1977, Ser. No. 772,165
Int. Cl.[2] G09B *9/02*
U.S. Cl. 35—12 C **20 Claims**

1. A simulator for practicing the mating of an observer-controlled object with a target comprising:

a. means for generating a first video signal representative of a scene containing the target as viewed from a target vantage point;

b. means for generatiing a second video signal representative of a scene containing the object as viewed from an object vantage point;

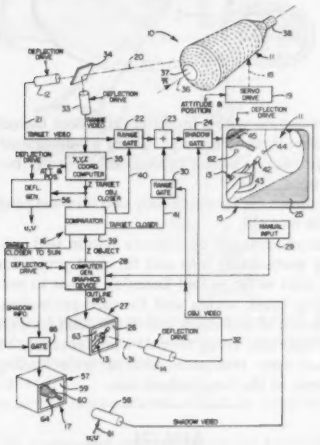
c. range means for generating, for each picture element of

the scene containing the target, a target range signal representative of the range of the contents of the last-mentioned picture element to the target vantage point, and for generating for each picture element of the scene containing the object, an object range signal representative of the range of the contents of the last-mentioned picture element to the object vantage point;

d. comparator means for comparing the target and object range signals of corresponding picture elements of the target and object scenes to identify which of said elements has its contents closer to its vantage point;

e. a television monitor having a viewing screen; and

f. gate means responsive to the comparator means for controlling the application to the monitor of the first and



second video signals whereby both the target and the object are simultaneously reproduced on the screen with the object appearing to block the target when the object is closer to the object vantage point than the target is to the target vantage point.

20. A method for practicing the mating of an observer-controlled object with a target comprising the following steps:

(a) generating on a television monitor a composite view of both the target and the object with the object occluding the target when the object is closer than the target to the viewer;

(b) generating the shadow of the object on the target; and

(c) determining engagement of a point on the object with the target by the spacing between said point and the shadow.

4,106,219

PLASTIC BONE USED FOR TRAINING PURPOSES BY SURGEONS

Urs Schneider, Kronbühl, and Rudolf Heller, Zurich, both of Switzerland, assignors to Synthes AG Chur, Chur and Contraves AG, Zurich, both of, Switzerland

Filed Nov. 19, 1976, Ser. No. 743,393

Claims priority, application Switzerland, Dec. 5, 1975, 15841/75

Int. Cl.² G09B *23/32*

U.S. Cl. 35—17 **4 Claims**

1. A plastic bone useful as a training device for surgeons for the mechanical joining of broken pieces of a bone fracture, comprising:

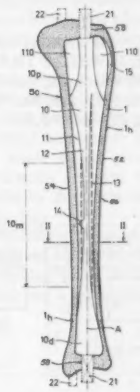
a molded plastic bone having a size and shape essentially corresponding to a shaft bone of a limb of a human being;

said molded plastic bone having an internal hollow cavity;

said internal hollow cavity including a marrow cavity located at the central region of the molded plastic bone;

said internal hollow cavity of the molded plastic bone being provided at said central region with a narrowmost substantially uniform and profiled cross-section having recesses extending between inwardly protruding ribs;

said internal hollow cavity extending past the marrow cavity towards both ends of the molded plastic bone into the region of spongy structured bone lacunae (spongiosa) of



the natural bone and widening at such locations to form widened portions;

said molded plastic bone having a wall structure which essentially corresponds to the solid wall regions (compacta) of the natural structure as to weight, strength and mechanical machinability.

4,106,220

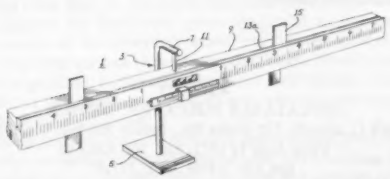
MATHEMATICAL TEACHING AID

Deane E. Hurd, 5034 W. Kalen Cir., Glendale, Ariz. 85301

Filed Jan. 17, 1977, Ser. No. 759,840

Int. Cl.² G09B *19/02*

U.S. Cl. 35—31 R **8 Claims**



1. An apparatus for illustrating and verifying mathematical operations involving integral and nonintegral numbers, comprising:

a. a base;

b. a balance arm having a center of gravity and graduations disposed on a face of said balance arm at predetermined longitudinally spaced intervals;

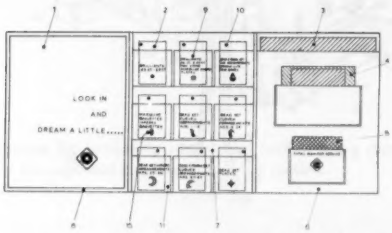
c. suspension means for pivotably suspending said balance arm from said base to permit rotation of said balance arm in a vertical plane and for preventing rotation of said balance arm in a horizontal plane;

d. at least two area-weights for performing mathematical problems in conjunction with said balance arm, said area-weights comprising a uniform density, uniform thickness sheet material, whereby the area of said area-weights is proportional to their weight and thereby permitting mathematical computations relating to areas, weights and area versus weight; and

e. attachment means for securely attaching said area-weights to said balance arm at any location along the length of said balance arm, said attachment means including means for

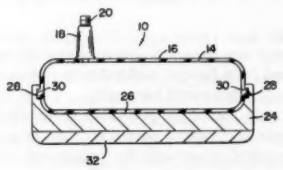
securing said area-weights to said balance arm independent of the force of gravity to maintain said attachment means operative.

4,106,221
TWO-DIMENSIONAL VISUALIZATION AID FOR THE RETAIL JEWELRY TRADE
Michael David Selon, 301 Wisconsin, Oak Park, Ill. 60302
Filed Feb. 2, 1977, Ser. No. 765,092
Int. Cl.² B44F *1/06*
U.S. Cl. 35—53 **3 Claims**



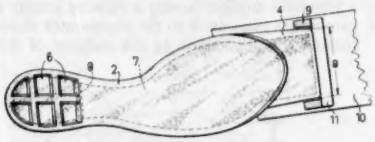
1. Apparatus for aiding the two dimensional visualization of what a jewelry customer's faceted stones will look like as a finished piece of jewelry comprising: a three-part electronically heat sealed folder housing a large number of separate transparent Mylar cards with different two-color permanently printed two dimensional images of different sizes, shapes, and arrangements of the stones; a two color lithographed and offset printed catalog of different blank jewelry settings; a black vinyl square viewing frame; wherein a selection of the large number of separate Mylar cards are manipulatable over the individual pictures of blank jewelry settings, isolated by the black frame, so as to present a two dimensional image to a retail customer of what their faceted stones will look like as a finished piece of jewelry.

4,106,222
INFLATABLE PODIATRIC DEVICE
Randall G. Houck, 721 Unity Dr., Indian Harbor, Fla. 32937
Filed Aug. 1, 1977, Ser. No. 820,610
Int. Cl.² A43B *3/12, 13/20*
U.S. Cl. 36—29 **17 Claims**



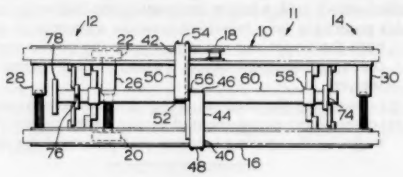
1. An inflatable podiatric device comprising:
a sole including an inflatable envelope formed of a flexible material having a first surface adapted to conform to a foot of a wearer thereof;
means extending through said envelope along said first surface for inflating said envelope; and wherein
said inflating means extends substantially above said first surface whereby said inflating means is engagable between adjacent toes of said wearer.

4,106,223
SKI BOOT
Hans Benseler, Hemmingen, Fed. Rep. of Germany, assignor to PUMA-Sportschunfabriken Rudolf Dassler KG., Nuremberg, Fed. Rep. of Germany
Filed Mar. 22, 1977, Ser. No. 780,039
Claims priority, application Fed. Rep. of Germany, Mar. 27, 1976, 2613266
Int. Cl.² A43B *5/04*
U.S. Cl. 36—117 **11 Claims**



1. In combination with a long run ski, a boot including a toe and comprising therewith: a sole having a longitudinal axis and a forward projection which extends substantially beyond the toe of said boot;
fastening means for fastening only said forward projection of said sole to a ski;
and an insert arranged exclusively within said sole and extending particularly into said forward projection of said sole at least as far as said fastening means to prevent any damaging break within said forward projection, at least that portion of said insert which is in said forward projection of said sole being flexible simultaneously to allow a sufficient turn resistance assured with loading arising transverse to the longitudinal axis.

4,106,224
CUTTING ASSEMBLY
Francisco De La Cruz Cuevas, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Mar. 16, 1977, Ser. No. 778,203
Int. Cl.² E02F *5/02*
U.S. Cl. 37—80 A **11 Claims**



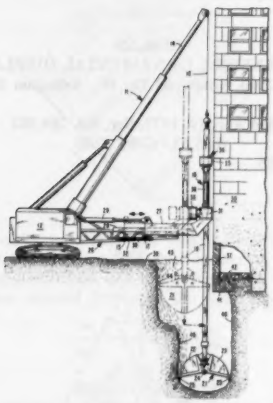
1. A cutting assembly comprising:
a support element;
a first cutting element having an outer end and extending generally laterally in one direction and being generally movable about the support element;
a second cutting element having an outer end and extending generally laterally in an opposed direction and being generally movable about the support element, said outer end being laterally spaced a preselected distance from the outer end of said first element, said first and second elements overlapping one another and being movable between a first position at which the distance between the outer ends of said elements is maximum and a second position at which the distance between said outer ends is minimum; and
means for releasably connecting said cutting elements, for controlled movement of the cutting elements generally perpendicular to said support element to a preselected position and maintaining the preselected position for making a single cut of substantially uniform width.

4,106,225

METHOD AND APPARATUS FOR EXCAVATING UNDERPINNING HOLES

Harry Schnabel, Jr., Bethesda, Md., assignor to Schnabel Foundation Company, Washington, D.C.

Filed Mar. 7, 1977, Ser. No. 775,115
Int. Cl.[2] B66C *3/02*; E02D *5/00*
U.S. Cl. 37—184 **14 Claims**



1. An excavator for digging and removing earth from a hole extending beside and at least partially under a structure to be underpinned which comprises:

a vertical rod;

earth removing digger means affixed to the bottom of said rod;

means for suspending said rod above the hole and for moving the rod vertically to permit said digger means to descend into and ascend out of the hole;

said digger means having a substantial horizontal reach from said rod to extend a substantial distance under the structure when suspended in the hole with the rod adjacent the structure;

reciprocable means engaging said rod to move said rod and said digger means linearly in a horizontal direction toward and away from the structure;

said digger means including a digging element movable in the direction of said horizontal reach; and

means to position said digger means relative to said reciprocable means and the structure so that the direction of said linear horizontal movement of said rod and said digger means is parallel to the direction of said horizontal reach.

4,106,226

BIDIRECTIONAL ROTARY EXCAVATOR

Raymond A. Hanson, c/o R.A. Hanson Co., P.O. Box 7400, Spokane, Wash. 99207

Filed Feb. 18, 1977, Ser. No. 769,932
Int. Cl.[2] E02F *3/24*
U.S. Cl. 37—190 **1 Claim**

1. A bidirectional excavating machine, comprising:

a rigid framework;

means carrying the framework for movement along a ground surface in a forward or rearward direction along a selected path;

an excavator wheel mounted to the framework for rotation about an axis transverse to said path;

drive means on said framework operatively connected to the excavator wheel for rotating it about said axis;

conveying means on said framework, said conveying means being located within the confines of the excavator wheel for receiving excavated material from the excavator wheel and for moving the material to one side of the machine;

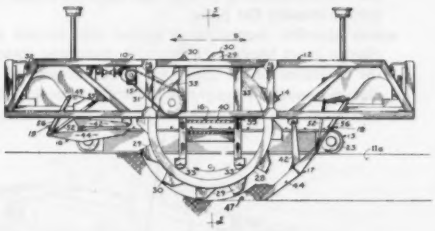
said excavator wheel having a plurality of peripheral bucket members for engaging and lifting the material upward upon rotation of the wheel and for subsequently dropping the lifted material onto the conveyor means;

first crumbing blade means pivotally mounted to the framework at a location forwardly adjacent to said excavator wheel about axes parallel to the rotational axis of the excavator wheel;

first lift means operatively connected between the framework and said first crumbing blade means for moving said first crumbing blade means between a lowered operative position and a raised inoperative position;

second crumbing blade means pivotally mounted to the framework rearwardly adjacent to the excavator wheel about axes parallel to the rotational axis of the excavator wheel;

second lift means operatively connected between the framework and said second crumbing blade means for moving said second crumbing blade means between a lowered operative position and a raised inoperative position;



the lowered inoperative position of each of said crumbing blade means being directed angularly downward substantially tangential to the periphery of the excavator wheel;

the raised inoperative position of each of said crumbing blade means being substantially horizontal;

each crumbing blade means including an elongated crumbing shoe that, in the lower operative position, is located adjacent the horizontal plane tangential to the bottom portion of the excavator wheel and closely adjacent the peripheral surface thereof, and that, in the raised inoperative position, is elevationally raised a substantial distance above its operative position so as to provide clearance for the excavator wheel;

each of said lift means comprising spaced rigid links pivotally connected to both the framework and crumbing blade means about parallel axes, the effective lengths of the respective links differing from one another so as to impart an angular folding motion to said crumbing blade means as they are moved between their operative and inoperative positions.

4,106,227

SPREADING APPARATUS FOR SHEET FEEDER

William W. Allen, Plantation; Charles E. Sweeney, Margate; Alvin G. Lundquist, Jr., Ft. Lauderdale, and Raymond T. Hersh, Coral Springs, all of Fla., assignors to Jensen Corporation, Ft. Lauderdale, Fla.

Filed Oct. 3, 1977, Ser. No. 838,750
Int. Cl.[2] D06F *67/04*
U.S. Cl. 38—143 **22 Claims**

1. In an apparatus having a conveyor for receiving laundry flat pieces, said apparatus including first, second and third pairs of clamps for releasably gripping respective laundry flat pieces at adjacent corners along a top edge thereof, the improvement which comprises:

means for normally positioning the first pair of clamps close to each other at a first loading station midway across the

apparatus for the insertion of said corners of a first laundry piece into said first pair of clamps by a first operator stationed there;

means for spreading said first pair of clamps apart laterally in opposite directions away from the centerline of the conveyor while said first pair of clamps continue to grip said first laundry piece;

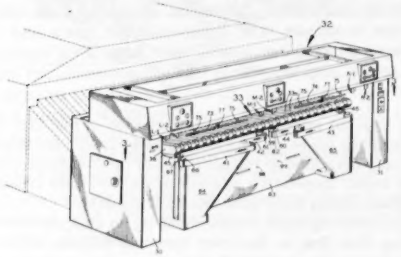
means for actuating said first pair of clamps to release said first laundry piece after said first pair of clamps have been spread apart;

means operable after the release of said first laundry piece for returning said first pair of clamps to their normal positions close to each other midway across the apparatus;

means for normally positioning said second pair of clamps close to each other at a second loading station near one end of the apparatus at one side of the centerline of the conveyor for the insertion of said corners of a second laundry flat piece into said second pair of clamps by an operator stationed there;

means for moving said second pair of clamps simultaneously from said second loading station laterally in one direction to positions close to each other midway across the apparatus while continuing to grip said adjacent corners of the second laundry flat piece;

means operable thereafter to spread said second pair of clamps apart laterally in opposite directions away from the centerline of the conveyor while said second pair of clamps continue to grip said adjacent corners of the second laundry flat piece, whereby to return one clamp of the



second pair toward said second loading station while moving the other clamp of the second pair farther away from said second loading station;

means for actuating said second pair of clamps to release the second laundry flat piece after they have been spread apart;

means operable thereafter for returning said other clamp of the second pair to said second loading station close to said one clamp of the second pair;

means for normally positioning said third pair of clamps close to each other at a third loading station near the opposite end of the apparatus at the opposite side of the centerline of the conveyor for the insertion of said corners of the third laundry flat piece into said third pair of clamps by a third operator stationed there;

means for moving said third pair of clamps simultaneously from said third loading station laterally in the opposite direction to positions close to each other midway across the apparatus while continuing to grip said adjacent corners of the third laundry flat piece;

means operable thereafter to spread said third pair of clamps apart laterally in opposite directions away from the centerline of the conveyor while said third pair of clamps continue to grip said adjacent corners of the third laundry piece, whereby to return one clamp of said third pair toward said third loading station while moving the other clamp of said third pair farther away from said third loading station;

means for actuating said third pair of clamps to release said third laundry flat piece after they have been spread apart;

means operable thereafter for returning said other clamp of said third pair to said third loading station close to said one clamp of said third pair;

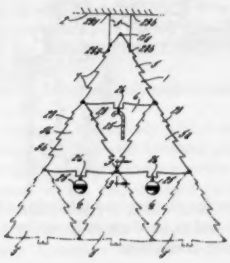
and means to prevent any one of said pairs of clamps from movement away from the corresponding loading station before a previously operated pair of clamps has released its laundry piece.

4,106,228

SUSPENSIBLE ORNAMENTAL DISPLAY

Jack Gibrich, 2953 Briarwood Dr. W., Arlington Heights, Ill. 60005

Filed Apr. 19, 1977, Ser. No. 788,802
Int. Cl.² G09F *7/00*
U.S. Cl. 40—605 **6 Claims**



1. A suspensible ornamental display comprising:

a plurality of rigid, substantially flat members, each of said members having the same shape and being of the same size, said members being arrayed in accordance with a regular pattern to form an assemblage wherein adjacent members are in partially overlapping relationship and openings are defined by said adjacent members, said openings having a shape substantially similar to said members, said assemblage being capable of enlargement to an assemblage of similar shape by increasing the number of members arrayed in said assemblage, said assemblage has a shape substantially similar to the shape of said members, said members are generally triangular in shape, and said similarly shaped openings are inverted; means for fastening together the overlapping portions of the members in said assemblage to form a rigid display that can be suspended; an ornamental device is suspended in at least one of said openings, said ornamental device being suspended from one of the members which define said opening; and means for suspending said ornamental display attached to the periphery of one of said members.

4,106,229

VEHICLE SIGN HOLDER

Hans F. Schmid, Verona, N.J., assignor to Mar-Kal Products Corporation, Montclair, N.J.

Filed Feb. 23, 1977, Ser. No. 771,263
Int. Cl.² G09F *7/00*
U.S. Cl. 40—611 **1 Claim**

1. A holder for rectangular placards of the type having a central indicia bearing area and a continuous marginal border surrounding said area and being of a uniform width, said marginal border being of a single color which contrasts with the background color of the central indicia bearing area of the placard, said holder comprising a substantially flat plate body of a size and shape to substantially register with a placard placed thereon, and integral marginal flanges on the plate body extending substantially around three sides thereof, the placard and plate body being rectangular, the flanges being of equal

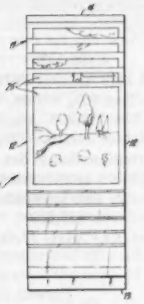
width with the placard marginal border and overlapping one face of the plate body and registering with said marginal border on three sides of the placard with the fourth side of the marginal border of the placard uncovered and exposed to view, and said flanges of the plate body having the color of the

marginal border to create the optical illusion to a distant viewer that the complete marginal border of the placard is exposed and uncovered, and a clip means on the plate body engaging the placard to secure the same releasably in the holder.

4,106,230
PHOTO ALBUM

Eugene E. Martinez, Woodbine Rd., Irvington-On-Hudson, N.Y. 10533, assignor to Robert H Reikel, Irvington-On-Hudson, N.Y.

Filed Feb. 10, 1977, Ser. No. 767,503
Int. Cl.[2] G09F *1/10*
U.S. Cl. 40—158 R **20 Claims**

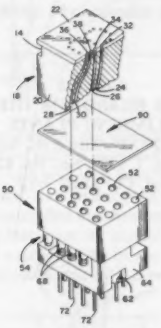


1. An album comprising a backing member, a plurality of similar, parallel flexible elongated strips, said strips each having a first longitudinal section attached to a surface of said backing member by means of pressure sensitive adhesive coating on said first section of said strip, each strip having a second pressure sensitive adhesive coated section extending from the first adhesive coated section of said strip and swingable away from said backing member, and a plurality of elongated ribbons of sheet material, adjacent said strips, there being one ribbon associated with each strip, respectively, each strip extending to one side of said ribbon associated therewith, in a direction toward the upper end of the backing member, each ribbon having a first section adhered only to the second adhesive coated section of the strip associated with said ribbon, and a second section extending from the first section of said ribbon, beyond the strip to which it is adhered, said second section of each of said ribbons being uncoated with adhesive and providing a pull tab which may be grasped by the user to facilitate pulling the ribbon off the second adhesive coated section of said strip, to which it is adhered, the attachment of said ribbons to said strips being less resistant to detachment of said ribbons from the strips than to detachment of said strips from the backing member, whereby said ribbons can be pulled off said strips without pulling the strip off the backing member, and to uncover the adhesive coated second section of the strip associated therewith, so that a photographic snapshot can be attached to said uncovered coated second section of said strip, by pressing a portion of the snapshot against said uncovered adhesive coating of the second section of said strip, the second section of each ribbon overlapping the strip next adjacent to the strip associated with the ribbon but located on the other side of said ribbon in a direction toward the lower end of said backing member, but not extending therebeyond.

4,106,231
LOW LEVEL LIGHT INDICATOR

Douglas K. MacNiel, Costa Mesa, Calif., assignor to Master Specialties Company, Costa Mesa, Calif.

Filed Dec. 6, 1976, Ser. No. 747,613
Int. Cl.[2] G09F *13/18*
U.S. Cl. 40—547 **11 Claims**



1. The improvement in a readout having a light source therein and means for conducting said light from said source to a display surface comprising:

a source of light comprising a plurality of incandescent lamps;

means for holding said source of light; means for connecting said incandescent bulbs to a power source;

a plurality of narrow elongated solid light pipes in proximate relationship to said light source that serve to receive light from said light source;

a relatively thin diffuser film between said source of light and said light pipes comprising a substrate of translucent material to permit the passage of light from said light source therethrough while at the same time modulating the light by diffusion;

a matrix cast around said light pipes for holding said light pipes; and,

a surface at which said light pipes terminate to provide a display in the form of the terminal portions of said light pipes at said surface.

4,106,232
TOY GLIDER

Daniel B. Higgins, 303 Cedar Crook Rd., Naperville, Ill. 60540

Filed Sep. 8, 1976, Ser. No. 721,522
Int. Cl.[2] A63H *27/00*
U.S. Cl. 46—79 **5 Claims**

1. A kit for assembling a toy glider comprising:

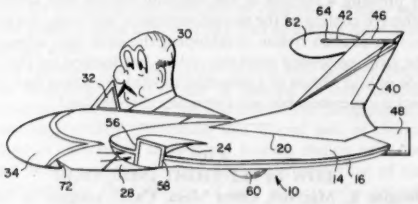
at least one planar sheet of material having a pattern of parts from which said glider is to be assembled, said parts including

a pair of oval-shaped discs adapted to be superimposed one

above the other and connected along complemental edges except at the front and at the rear center thereof,

means adapted to be inserted between said discs at the front thereof to form an air chamber between said discs,

means adapted to be inserted between said discs at the rear



center thereof to receive air therethrough flowing from said chamber while said glider is in flight,

a fuselage adapted to be connected to the front edge of said superimposed discs, and

at least one tailpiece adapted to be connected to one of said discs.

4,106,233

IMITATION BARK BOARD FOR THE SUPPORT OF CLIMBING PLANTS

Alvin E. Horowitz, 2320 SW. 23rd Ave., Miami, Fla. 33145

Filed Aug. 1, 1977, Ser. No. 820,886
Int. Cl.[2] A01G *9/12*
U.S. Cl. 47—44 **1 Claim**

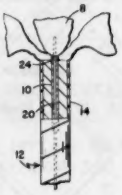
1. An imitation bark board member for the support of climbing ornamental plants and the like comprising, in combination, an integrally formed, elongated, substantially rectangular body portion, one side of said body portion having a three-dimensional surface texture simulating the texture of natural wood bark, and interlock means for removably interfittingly connecting a plurality of the imitation bark board members in end-to-end relation, said interlock means comprising a pair of prongs extending outwardly of one end of said body portion and a pair of sockets at the other end of said body portion, said prongs of one of the bark board members being receivable one each in the sockets of another bark board member, means for removably interconnecting a plurality of the bark board members along abutting longitudinal edge portions thereof, said longitudinal edge interconnecting means comprising a circular bead formed along one edge of said body portion and a recess of semi-circular cross-sectional configuration formed along the other longitudinal edge of said body portion, said body portion being of arcuate transverse cross-sectional shape and formed with a plurality of uniformly spaced, circular protuberances serving as anchoring means for the tendrils of climbing plants, said recess of semi-circular cross-sectional configuration being open to the other side of said substantially rectangular body portion to permit a pair of the bark board members to be interconnected back-to-back along their opposing longitudinal edge portions.

4,106,234

ARTIFICIAL STEM ASSEMBLY FOR A SHORT STEM CUT FLOWER

Joseph Sebato Gallo, 58 Peach St., Walpole, Mass. 02081

Filed Jul. 21, 1976, Ser. No. 707,317
Int. Cl.[2] A01G *5/00*
U.S. Cl. 47—55 **1 Claim**



1. An artificial stem for a natural short stem cut flower having, in combination,

a self supporting exterior tube which is straight throughout its length, and which has a diameter greater than the diameter of the stem of the flower;

a loose wrapping of an absorbent wick material slideably received within said tube; and

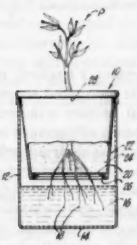
a flocked wire contained within said wick material providing a central core for said artificial stem, said flocked wire extending out of the end of said tube at both ends, one end of said flocked wire being connected to a flower, passing completely through the short stem of the cut flower and into the base of the flower in a direction substantially along the axis of said stem, the lower end of said wire and the wrapping being bent sharply, upwardly over the lower rim of said tube to hold the flower, the flocked wire, and the wick in position relative to said tube.

4,106,235

HORTICULTURAL IMPROVEMENTS

Walton J. Smith, P.O. Box 461, Wilton, Conn. 06897

Continuation of Ser. No. 712,806, Aug. 9, 1976, abandoned, which is a continuation of Ser. No. 571,853, Apr. 25, 1975, abandoned, which is a continuation of Ser. No. 184,234, Sep. 27, 1971, abandoned, which is a continuation of Ser. No. 850,121, Aug. 11, 1969, abandoned. This application Sep. 22, 1977, Ser. No. 835,809
Int. Cl.[2] A01G *31/00*
U.S. Cl. 47—59 **2 Claims**



1. A portable planter for house plants comprising an upper plant holder means received in a lower vessel containing water for the plant such that the lower vessel is effectively closed to prevent loss of water vapor, the water level being below the bottom of the plant holder means, the bottom of said plant holder means including a support means comprising crossing reinforcing ribs supporting a removable aluminum window screen, said bottom being at least 34% open and holding fine particulate plant-supporting material at least directly on said

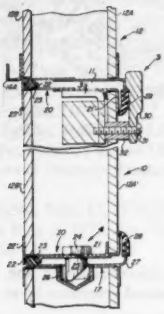
screen and accomodating a substantial root system, said screen having openings at least 1/36 inch and smaller than about 150 inch in the largest dimensions.

4,106,236

FIRE DOOR FOR TRAILERS

Howard G. Oliphant, Sparks, Nev., assignor to H. W. Kochs, Jr.; R. M. Geer, both of Medina, Ohio and Lois Jean Cason, Reno, Nev.

Filed Mar. 30, 1977, Ser. No. 782,632
Int. Cl.[2] E05C *15/02*
U.S. Cl. 49—141 **2 Claims**



1. A fire door comprising a casing forming a door opening,
said casing comprising side members, header and a sill,
said sill being provided with an opening therein,
a fire door mounted within said door opening and having a frame extending around its periphery,
engagement means extending from the side of said frame juxtapositioned to said sill and within said opening forming a loose fit therewith,
said engagement means comprising a bolt means,
the end of said bolt means fitting into said opening being tapered for aiding in its movement out of said opening when the door is pushed away from its casing from a latch side thereof,
a rotatable latch means mounted on said door for detachably interlocking with said header in a given position and when rotated to another position releasing said fire door from said casing,
said side members, header and sill each being provided with a flange extending over the edge of said fire door on the latch-mounted side thereof,
a resilient finger mounted on the edge of said flanges for engaging the surface of said fire door on the latch-mounted side thereof, and
resilient means mounted on the edge of said frame adjacent said sill forming a pivot for said fire door,
whereby a push on said fire door near said latch means will cause said fire door to rotate about an edge of said sill means causing said engagement means to move out of said opening and said fire door to drop away from said casing.

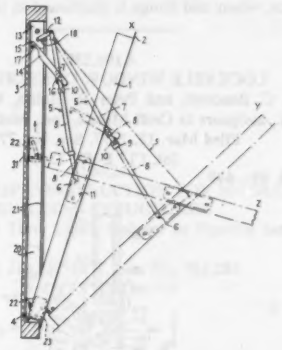
4,106,237

WINDOW ASSEMBLIES

Johannes Harald Bierlich, 15 Oresundshoj, Charlottenlund, Denmark

Filed Jan. 25, 1977, Ser. No. 762,292
Claims priority, application United Kingdom, Feb. 2, 1976, 4059/76
Int. Cl.[2] E05D *7/06*
U.S. Cl. 49—249 **6 Claims**

1. A window assembly comprising a substantially rectangular sash mounted in a window frame for opening by inward swinging movement about hinge means providing a horizontal axis which is adjacent the bottom of the sash, said hinge means being slidable in upright guides on the stiles of the window frame, and two extensible stays each respectively connected by pivot connections to the approximate midpoint of a side of the sash and to a point adjacent the top of the corresponding stile of the frame, said stays in their fully extended positions permitting the sash to be tilted about the said midpoint pivots with simultaneous sliding movement of the hinge means up and down the respective guides, the said hinge means comprising



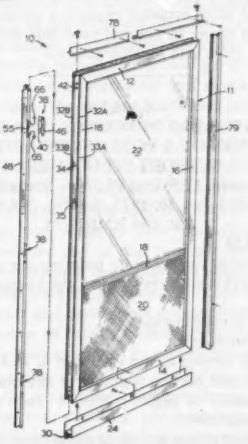
two first members slidable in the upright guides on the frame stiles respectively, two second members respectively fixed to the two sides of the sash and each having pivot means on said horizontal axis, a first lever interconnecting each said pivot means with its associated first member and a lever arrangement co-acting with said first lever for displacing said pivot means and said horizontal axis inwardly of the window frame upon initial opening of the sash and in the reverse direction upon closing the sash.

4,106,238

INTERCHANGEABLE STORM DOORS

Alfred Bonello, Islington, Canada, assignor to Indal Product Limited, Weston, Canada

Filed Oct. 26, 1976, Ser. No. 735,401
Int. Cl.[2] E05D *7/02*
U.S. Cl. 49—382 **9 Claims**



1. A door assembly including a door having a top, bottom and side rails along each longitudinal edge of the door, at least one hinge to be secured to the door, and means, secured to the

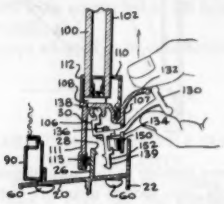
at least one hinge, to be secured to a door frame to mount the door, the side rails having channels running along a substantial length of the door opening at the top or bottom, of the door, the said channels being of a configuration to accommodate the at least one hinge, the at least one hinge having a hinge flange being adapted to be secured to, or removed from, the door only by sliding it from the top or bottom portion of the channel into position, and fastening means for securing the flange of the at least one hinge to the bottom of the channel upon being driven through said flange and the bottom of the channel into the door, when said flange is positioned in the channel.

4,106,239

LOCKABLE WINDOW CONSTRUCTION

Joseph C. Bancroft, and Peter R. Hallin, both of McComb, Miss., assignors to Croft Metals, Inc., McComb, Miss.

Filed Mar. 15, 1977, Ser. No. 777,603
Int. Cl.[2] E05D *13/04*
U.S. Cl. 49—449 **33 Claims**



1. A lockable window comprising a supporting frame, a movable vent pane frame mounted for movement on said supporting frame between an open position and a closed position, movable latch means for locking said movable vent pane frame in said closed position, a movable hand operated latch actuator connected to said movable latch means for unitary movement therewith, latch support means on said movable vent pane frame supporting said movable latch means and latch actuator for both pivotable and linear movement on said movable vent pane frame so that the movable latch is pivotable to a locking position in which said latch means engages retaining means on said supporting frame to lock said movable vent pane frame in its closed position and is linearly movable into a holding position while in said locking position in which a portion of said latch actuator engages a portion of said movable vent pane frame to prevent pivotable movement of said latch actuator from said locking position.

4,106,240

APPARATUS FOR PRECISELY INDEXING THE ORIENTATION OF A PORTION OF A DEVICE WITH RESPECT TO A SUPPORT STRUCTURE OF THE DEVICE

Paul I. De Bartolo, 21 Sylvan Pl., New Rochelle, N.Y. 10801

Filed Jan. 10, 1977, Ser. No. 758,165
Int. Cl.[2] B24B *9/16*
U.S. Cl. 51—125 **11 Claims**

1. An apparatus for precisely indexing the orientation of a portion of a device with respect to a rigid support structure of the device,

comprising incombination,

a first reference lever;

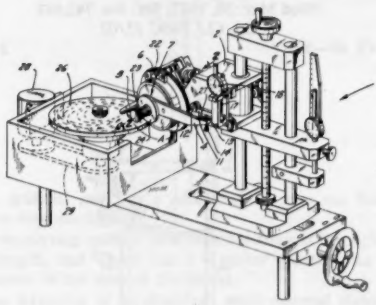
digital angle setting means operable to lock said reference lever and said portion together at any one of a predetermined number of angles relative to each other to form a rigid configuration;

said support structure including a first pivot means pivotably supporting said rigid configuration in substantially a first plane whereby said rigid configuration is constrained to rotate about said first pivot means;

a second reference lever;

second pivot means mounted on said rigid support in fixed special relation to said first pivot means, and pivotably supporting said second reference lever to constrain said second reference lever to rotate in a second plane substantially parallel to said first plane;

said first reference lever including a section projecting into said second plane and intersecting said second reference lever at a predetermined first place whereby rotational movement of said first reference lever is transmitted to



said second reference lever, the non-pivotably secured end of the second reference lever extending beyond said first place;

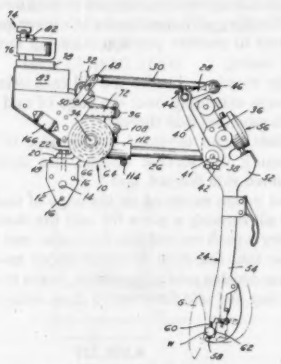
relative position indicating means operably connected to said rigid structure is fixed spacial relation to both said pivot means and to a second place defined on the portion of the second reference lever extending beyond said first place, to indicate relative rotational motion of said second reference lever to said rigid structure.

4,106,241

GRINDING GAUGE SUPPORT

James C. Fisk, G-3219 E. Bristol Rd., Burton, Mich. 48529

Filed Oct. 28, 1976, Ser. No. 736,515
Int. Cl.[2] B24B *49/04*
U.S. Cl. 51—165.74 **27 Claims**



1. A gauge support for a machine tool which has a workpiece holding means and means engagable with the workpiece when so held for performing work thereon including, in combination:

an elongated arm pivotally connectable at one end thereof to a machine tool and supporting a workpiece measuring gauge adjacent to its opposite end for bodily movement toward and away from the workpiece;

a carriage mounted for reciprocal motion along a fixed track and carrying means abuttably engagable with a part of the

elongated arm adjacent to its pivotally connectable end and operable upon carriage movement in one direction on its track to swing the arm about the pivotally connected end and cause bodily translational movement of the gauge toward the workpiece;

a cam track carried by the carriage having at least a portion of its length inclined to the fixed track;

a member pivotal about a stationary axis and having one end thereof riding on the cam track with the result that when said riding end travels that portion of the cam track inclined to the carriage track the member is rocked about its pivotal axis; and

means responding to said rocking motion of the pivotal member for imparting lateral motion to the gauge relative to the gauge supporting arm.

4,106,242

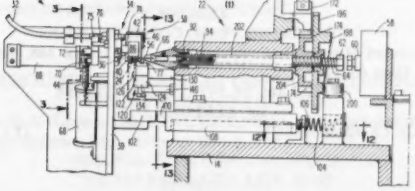
WORKHEAD FOR AN AUTOMATIC BUR GRINDING MACHINE

William McCandless, Toledo; Robert F. Leu, Delta, both of Ohio; Ernest A. Kroder, Felton, Pa., and Charles J. Tomecek, Curtice, Ohio, assignors to Dentsply Research & Development Corp., Milford, Del.

Division of Ser. No. 666,848, Mar. 15, 1976, Pat. No. 4,052,821. This application May 2, 1977, Ser. No. 793,204

Int. Cl.[2] B24B *3/06*

U.S. Cl. 51—225 **6 Claims**



1. A work head for a bur grinding machine to support and index bur blanks to be ground by grinding units on said machine, said work head comprising in combination, a base member adapted to be slidably supported by a rotatable table, an elongated bearing member attached to said base member and having an elongated bearing bore extending longitudinally of said bearing member, a spindle rotatably supported within said elongated bore, a multi-jaw collet supported by said spindle and the jaws of said collet projecting beyond one end of said spindle to receive and support therein a bur blank to be ground by said machine, a cam rotatably mounted on the end of said bearing member opposite that from which the nose end of the collet projects and having a cam face operable for engagement with a cam follower on said bur grinding machine, whereby said cam will move said work head axially and correspondingly move a bur blank when mounted in said collet relative to a grinding head of a bur grinding machine, said cam having a gear connected thereto for rotation therewith, another gear mounted on said work head adjacent said rotatable cam and meshing with said gear on said cam to drive the same for rotation about the axis of said bearing member and adapted to be interengaged by a gear rack on a grinding machine when the work head is mounted therein for rotation of said gear and thereby rotate said collet and spindle while said cam moves said collet and spindle axially to produce helical flutes and teeth on a bur blank, an index wheel mounted on said bearing member adjacent said gear on said cam and coaxial therewith, said index wheel being fixed to said spindle and having a plurality of notches therein spaced evenly around the circumference thereof and corresponding in number to the flutes to be ground in a bur blank, and an indexing dog mounted on said gear on said cam and engageable with the notches in said index wheel to interconnect said gear on said cam and spindle to effect rotation of said spindle by said another gear when the same is rotated by said rack.

4,106,243

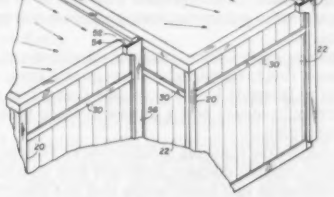
SLOPED ROOF CONSTRUCTION FOR MODULAR BUILDING STRUCTURES

John J. Horn, El Toro, Calif., assignor to PepsiCo Inc., Purchase, N.Y.

Filed Jan. 25, 1977, Ser. No. 762,283

Int. Cl.[2] E04H *1/00*

U.S. Cl. 52—16 **6 Claims**

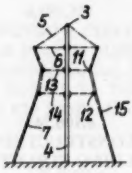


1. In a mobile modular building structure having a length, width and height, with ends being defined by the shorter dimensioned sides which extend the width of the structure, and sides being defined by the longer dimensioned sides which extend the length of the structure, including a floor portion; upstanding wall members; a generally horizontal roof structure which is substantially rectangular in configuration; and a ceiling extending below said horizontal roof structure defining a space therebetween, the improvement comprising; parapets extending along the upper external edge of said generally horizontal roof structure so as to form a depressed planar upper roof surface therebetween, said planar roof surface being sloped downwardly from a high-sided end thereof towards the opposite low-sided end of said roof structure so as to thereby provide at least one drainage flow passageway extending toward said low-sided end of said roof structure, a drainage gutter being formed along the lower end edge of said sloped roof surface, said parapet including portions covering said gutter and at least one downspout communicating with said gutter for drainage of liquids collected on said upper roof surface, electrical power and utility supply conduits, air conditioning, heating equipment and the like being arranged in said space between the ceiling and roof proximate the low-sided end of said planar roof structure, and vents being provided in the modular building structure proximate the utility equipment in said space in the low-sided end to provide the modular building structure the flexibility of being placed end to end with a second, similar building structure with the high-sided ends adjoining, whereby the open ends are always the low-sided ends having the utilities and vents therein.

4,106,244
COOLING TOWER

Erich Kessler, Krefeld; Georg Hassemer, Bickenbach, and Paul Weber, Goddelau, all of Fed. Rep. of Germany, assignors to Fried. KRUPP Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Aug. 16, 1972, Ser. No. 281,106
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1971, 2142491
Int. Cl.[2] E04H 5/12
U.S. Cl. 52—63 4 Claims

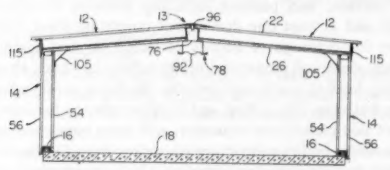


1. A cooling tower having an exit opening and comprising in combination:
(a) a foundation and a post mounted thereon,
(b) a rigid upper spacer ring below the top of said post surrounding the exit opening,
(c) cable means under tension on said post projecting downwardly and over the exit opening and having said rigid upper spacer ring suspended thereby,
(d) one smaller spacer ring arranged below said upper spacer ring,
(e) cables guided from fastening locations on said upper spacer ring to fastening locations on said lower spacer ring and to fastening locations on said foundation spaced outwardly from said post a greater distance than said lower spacer ring,
(f) whereby the fastening locations on said lower spacer ring have a smaller distance from said post than the fastening locations on said upper spacer ring and than the fastening locations on said foundation,
(g) radial cable-type connection means provided between said spacer rings and said post that are capable of being loaded only under tension exclusively and then are preloaded under tension only for resistance against wind forces,
(h) a non-self-supporting mantle laced in at said lower spacer ring particularly to withstand wind forces as supported by said cables and extending downwardly from said upper spacer ring to leave an opening through said upper and lower rings.

4,106,245
FRAMELESS METAL BUILDING

Colin F. Lowe, P.O. Box 128, Hutsonville, Ill. 62433

Filed Sep. 9, 1977, Ser. No. 831,781
Int. Cl.[2] E04B 7/02
U.S. Cl. 52—90 22 Claims

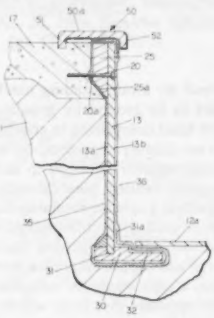


1. A frameless metal building comprising a plurality of generally rectangular roof panels and wall panels, each of said roof and wall panels including parallel spaced longitudinally extending sheet metal spacer members rigidly connected by laterally extending sheet metal spacer members, each of said roof and wall panels including inner and outer sheet metal skins rigidly secured to the corresponding said spacer members, said wall panels being secured together in adjacent relation to form parallel spaced opposite side walls and said roof panels being secured together in adjacent relation to form a roof extending from said opposite side walls to a ridge extending parallel between said side walls, means including an inner ridge member extending along said ridge and rigidly connecting said spacer members and said inner skins of said roof panels on opposite sides of said ridge and being effective to transfer tension forces therebetween, means including an outer ridge member extending along said ridge and rigidly connecting said outer skins of said roof panels on opposite sides of said ridge and effective to transfer compressive forces therebetween, and means for rigidly connecting said spacer members and said skins of said roof panels to said spacer members and skins of said wall panels for transferring loads from said roof panels through said wall panels to a base supporting said wall panels and for utilizing said wall panels to resist bending of said roof panels.

4,106,246
SWIMMING POOL CONSTRUCTION

Leonard Howard LaFountaine, Rte. No. 1 Box 348, Curtice, Ohio 43412

Filed Jul. 14, 1977, Ser. No. 815,695
Int. Cl.[2] E04H 3/16
U.S. Cl. 52—169.7 12 Claims



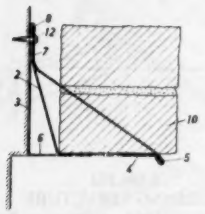
1. A pool construction of the below ground level type and having a bottom wall and marginally connected, vertically upstanding linear side and end walls disposed to, in concert, define a polygonal, water-tight enclosure for the water in said pool, said side and end walls each having a lower edge defining a seam with said bottom wall and an upper edge, said side and end walls including:
a center core formed of a plurality of planar members arranged in mutual edge-to-edge aligned abutment to form the linear extent of said walls and
a layer of resin-impregnated fiber glass bonded to each planar opposed surface of said wall in a manner to completely encapsulate said linear array of core panels to provide a water proof barrier and means for sealing said seams.

4,106,247

LINTEL FOR SUPPORTING E.G. ARCHES OVER WALL OPENINGS, FACADE COVERINGS AND SIMILAR

Lennart Svensson, Tallbacken2, Kungsbacka, Sweden (434 00)

Filed May 31, 1977, Ser. No. 802,188
Claims priority, application Sweden, Jun. 1, 1976, 7606131; Feb. 15, 1977, 7701629
Int. Cl.[2] E06B 1/04
U.S. Cl. 52—204 9 Claims



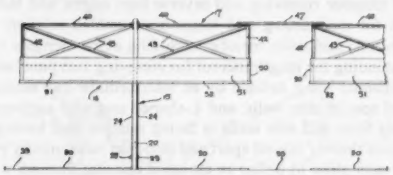
1. A lintel for supporting the first course at the walling of e.g. arches over wall openings, brick facades and similar, said lintel having a substantially L-shaped cross section, wherein the lintel comprises a relatively thin plate profile or similar, the horizontal leg of which at its end is provided with a flanged portion or throating forming an attachment for at least some tension bands arranged in the butt joints between the bricks of the first course, said tension bands at their opposite ends being connected to the end part of the second leg of the lintel, said second leg making an angle with the horizontal leg and said tension bands being displaceable along the lintel for adjustment in a correct position between two bricks.

4,106,248

DEMOUNTABLE MODULAR DISPLAY SYSTEM FOR FURNITURE AND THE LIKE

Gerald A. Zapara, Santa Ana, Calif., assignor to National Storage Systems, Inc., Newport Beach, Calif.

Filed Feb. 7, 1977, Ser. No. 766,428
Int. Cl.[2] E04H 3/04; A47F 10/00
U.S. Cl. 52—234 5 Claims



1. In a walk-through display area incorporating an existing floor and a pre-determined area for viewing merchandise under a ceiling and in front of an upright background panel without any structural obstacles along the front and side boundaries of the walk-through display area, a modular construction system for carrying the background panels and the ceiling comprising:

a plurality of vertical posts mountable on the floor and each having a lower portion below a ceiling reference point for carrying the background panels and an upper portion above the ceiling reference point;

a separate truss member attachable to and cantilevered from the upper portion of each post over the walk-through display area and including a plurality of coplanar support beams extending forwardly to carry the ceiling under the truss member and overlying the walk-through display area; and

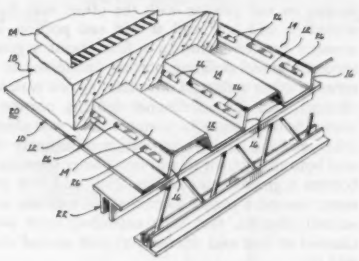
single brace means connectable between adjacent truss members from the rear of one truss member to the front of another truss member to cover an enlarged display area by positioning the vertical posts and their corresponding truss members in side-by-side relationship.

4,106,249

METHOD AND APPARATUS FOR INTERLOCKING AND VENTING A STRUCTURAL DIAPHRAGM

Virgil R. Morton, Redondo Beach, Calif., assignor to Verco Manufacturing, Inc., Phoenix, Ariz.

Filed Jun. 30, 1977, Ser. No. 811,607
Int. Cl.[2] E04B 1/16
U.S. Cl. 52—336 19 Claims



1. A diaphragm for resisting horizontal shear loads imposed upon buildings, said diaphragm comprising:

a. a fluted deck secured to the framework of a building, said fluted deck including impervious top and bottom flutes and webs alternately interconnecting said top and said bottom flutes;

b. a moldable hardenable material deposited upon said fluted deck while said material is flowable;

c. louvers disposed in at least some of said webs in a vertically non-overlapping relationship for venting the louvered ones of said webs to promote curing of said material and for interlocking said cured material with the louvered ones of said webs of said fluted deck, said louvers being downwardly oriented to minimize loss of said material while it is flowable;

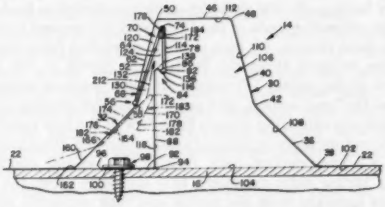
whereby, the horizontal shear load resistance of said top and bottom flutes remains unimpaired by apertures therein and curing by ventilation of said material in said fluted deck to lock said material therein is encouraged by said louvers while loss of said material through said louvers is minimized.

4,106,250

SELF-INTERLOCKING STANDING SEAM FOR A BUILDING PANEL

Gary Eugene Cummings, Cape Coral; Gary Lee Harvey, and Charles Wallace Dean, both of Fort Myers, all of Fla., assignors to Dean Steel Buildings, Inc., Fort Myers, Fla.

Filed Apr. 12, 1977, Ser. No. 786,826
Int. Cl.[2] E04D 3/363
U.S. Cl. 52—394 8 Claims



1. A pair of elongate roof panel members comprising:

a male element on a longitudinal side edge of one member,

said male element including a "V" shaped extension member which opens toward a roof on which said one member is mounted and has one leg thereof being connected to the one member, and the other leg thereof having an edge defining portion thereon;

a female element on the other panel member including a first channel defining portion on one longitudinal side edge thereof defining a channel which opens toward a roof on which said other panel member is mounted, said other member further including a double wall skirt member having one wall thereof connected to said first channel defining portion so that said skirt extends outwardly of said first channel defining portion and toward the roof on which said other panel member is mounted, said skirt having an end portion with the other wall thereof connected to said one wall at said end portion, said other member further including a first planar segment and a second channel defining portion connected to said skirt member other wall, said skirt defining one wall of said first channel, said second channel defining portion having a planar bottom segment connected to said skirt member other wall and having a lip portion offsettingly connecting said bottom segment to said first planar segment with said bottom segment being off-set from said first planar segment toward a center of said other member to define a second channel, said skirt extending over said second channel so that said skirt covers said second channel and said lip;

said male element "V" shaped extension member being wedged between said skirt and said lip with said edge defining portion being located between said lip and said bottom planar segment and captured between said lip and said bottom planar segment when said male element extension member other leg is located in said second channel to lock the engageable members together; and

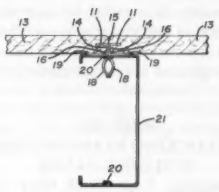
attaching means attaching one of said elements to a roof.

4,106,251

RELOCATABLE WALL MOUNTING SYSTEM

Nels Nelsson, Des Plaines, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed May 23, 1975, Ser. No. 580,454
Int. Cl.[2] E04B *2/58, 2/76*
U.S. Cl. 52—765 **3 Claims**



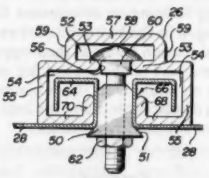
1. A unique relocatable wall mounting which comprises in combination, (1) a first panel having attached thereto, (2) a first half-clip, (3) a second panel having attached thereto, (4) a second half-clip, said first and said second half-clips characterized by having, (5) first shoulder sections adapted to be driven into the respective ends of the first panel and second panel to secure them thereto, (6) base sections extending from the first shoulder sections along the ends of the panels to the outer corners of the panels, (7) second shoulder sections extending beyond the base section, said second shoulder section of said first half-clip extending along a back face of the first panel, and said second shoulder sections of said second half-clip extending along a corresponding back face of the second panel, (8) curved spring arms extending first arcuately from the base sections outward from the panels and then arcuately inward toward the base section with the curved sping arms opposing one another and acting in conjunction to form a full spring clip, and (9) a slotted support member for engaging the full spring clip formed by mounting the first panel with the first half-clip thereon end-to-end adjacent to the second panel with the second half-clip thereon and said full clip is inserted into a slot in the support member by compressing the opposing curved spring arms of the half-clips forcing them together to the point that they are essentially flat as they pass through the slot in the support member whereupon they opposingly spring back to their original arcuate shape thereby attaching the mounted panels to the slotted support member.

4,106,252

BUILDING STRUCTURE

Peter T. Rutten, Plainfield, Ill., assignor to Railoc Company, Inc., Plainfield, Ill.

Filed Jan. 27, 1977, Ser. No. 763,109
Int. Cl.[2] E04D *3/00;* **E04B** *7/00*
U.S. Cl. 52—762 **3 Claims**



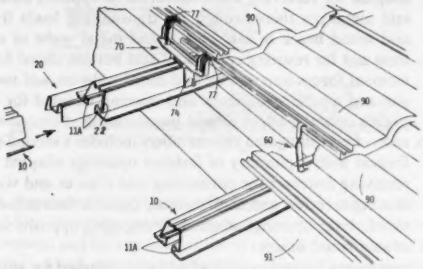
1. A joint construction for joining at least two adjacent panel members of a building roof construction or the like, to provide a substantially waterproof joint between said panels, which joint can be assembled from the interior of said construction, said joint construction comprising: at least two panel members having edges formed to reverse a bent configuration; a rigid rafter member receiving said reverse bent edges; and holding means for maintaining said edges in assembled relation with said rafters; said rafter member including a first elongate channel extending the length thereof for receiving said panel edges, said channel being defined by an intermediate wall section, a pair of spaced side walls, and L-shaped end wall sections extending from said side walls in facing relation, and having the free ends thereof spaced apart and disposed substantially parallel to each other to define an elongate opening through which said panel edge portions extend into said first channel, a second channel provided by an elongate, generally U-shaped wall portion formed integral with said intermediate wall to provide a fully enclosed second channel, and elongate passage means formed in said intermediate wall interconnecting said first channel and said second channel; said holding means comprising a plurality of bolt and nut assemblies, with each bolt including an enlarged head portion disposed in said channel, and a polygonal shaped portion engaged in said elongate passage means, and a threaded end to which said nut is engaged extending through said first channel and outwardly of said opening, and wedge member engaged over each said bolt and drawn interiorly of said first channel to force and maintain said reverse bent edge portion in engagement with the free ends of said L-shaped end wall sections said rafter member, said rafter being disposable exteriorly of said roof construction, with the integral nature of said U-shaped section providing a substantially waterproof joint with said nut and bolt assemblies and said wedge members housed within said rafter member.

4,106,253

TILING SYSTEM FOR ROOFS

Raymond Joseph Aarons, Jindalee, Australia, assignor to Monier Colourtile Pty. Ltd., Darra, Australia

Filed Dec. 21, 1976, Ser. No. 753,109
Claims priority, application Australia, Dec. 24, 1975, PC4388
Int. Cl.[2] E04D *1/34*
U.S. Cl. 52—547 9 Claims



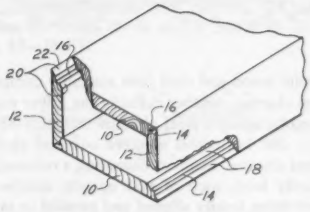
1. A tiling system for roofs including a sheet metal tiling batten, a bracket attaching said batten to a roof-rafter, said batten being formed with a top, side-walls and a groove extending inwardly below each side-wall, said bracket carrying an upstanding lug shaped to fit within said batten between its top and said grooves and to extend downwardly between said grooves to below said batten and a tile clip engaging said batten and holding overlapping adjacent roof tiles against said batten, said tile clip comprising two spaced hooks extending upwardly and of different height engaging respective side edges of the overlapping adjacent roof tiles, and opposed lower hooks engaging in both grooves of said batten.

4,106,254

ASSEMBLY MITER JOINT

Clyde A. Jack, 131 Ford St., Youngsville, Pa. 16371, and Evander E. Dargan, P.O. Box 826, Florence, S.C. 29501

Filed Jan. 6, 1977, Ser. No. 757,371
Int. Cl.[2] E04C *1/04*
U.S. Cl. 52—574 3 Claims



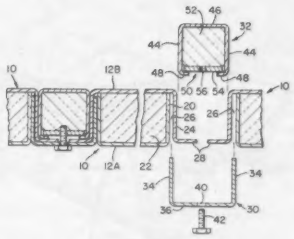
1. Wooden boards for intimately contacting lengthwise miter joint assembly in pluralities thereof for selectively forming angular, U, hollow box or beam, and flat cross-sectional assembly configurations thereof, comprising opposite side edges extending between the parallel flat sides of said boards, said side edges being suitably shaped to form miter joints, forming basically isosceles trapezoid cross-sections of said boards with the parallel flat sides thereof, having tongues and grooves thereat for mating contact in said joints for causing registered alignment thereof during said intimately contacting assembly thereof, and having one of said tongues in one said edge of each said board and one of said grooves in the other said edge thereof, each of said tongues and grooves being of effective V-shape, of symmetrical shape in cross-section at the mating portions thereof about the widthwise center of its respective miter surface, of effective included angle in cross-section at the mating portions thereof permitting said assembly and disassembly of any said board to and from two said boards each in said intimately contacting assembly therewith at said opposite side edges thereof by a single rectilinear board motion of said any said board perpendicular to the flat sides thereof, and of lengthwise extent along its respective said board.

4,106,255

WALL PANEL ASSEMBLIES

Alan Eckel, Westford, Mass., assignor to Eckel Industries, Inc., Cambridge, Mass.

Filed Sep. 6, 1977, Ser. No. 830,385
Int. Cl.[2] E04C *1/10*
U.S. Cl. 52—582 17 Claims



1. A modular wall assembly comprising in combination:

at least two panels each including a substantially flat body, a tongue at an edge of said body extending substantially parallel to and spaced from said body so as to form a channel therebetween, and a flange portion carried by said tongue and extending away from said channel, said panels being aligned and oriented so that said edges are in mutually confronting and spaced relationship;

a first connector member having two parallel spaced-apart side plates and a web connected to and supporting said side plates, each of said side plates extending within a corresponding one of said channels and making a snug fit with the adjacent tongue and flat body;

a second connector member having two parallel spaced-apart side plates and a web connected to and supporting said side plates, the side plates of said second connector extending between and making a snug fit with said tongues; and

means associated with said first and second connector members for securing said members together so as to clamp said flange portions therebetween.

4,106,256

ADJUSTABLE SHORING APPARATUS

David L. Cody, Hoffman Estates, Ill., assignor to Symons Corporation, Des Plaines, Ill.

Filed Dec. 1, 1976, Ser. No. 746,314
Int. Cl.[2] E04H *12/18*
U.S. Cl. 52—646 8 Claims

1. Adjustable shoring apparatus which comprises

upper and lower pairs of spaced apart parallel chords having horizontally extending longitudinal axes, the chords in said lower pair being spaced beneath and vertically aligned with respective chords in said upper pair,

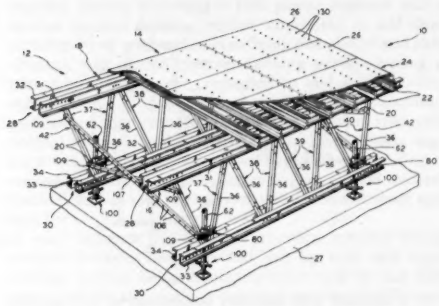
a plurality of struts extending obliquely from said upper chord pair to said lower chord pair and between the chords in each pair in a continuous longitudinal series of strut pairs of like substantially V-shaped configuration having their apices at said lower chord pair, the center lines of successive strut pairs being uniformly spaced apart,

means connecting the upper and lower ends of said struts respectively to the chords of said upper and lower pairs in

a truss-like structure constructed essentially of said struts and said chords and adapted for supporting a load on the chords of said upper pair,

a plurality of vertically extending elongated legs each having a vertical series of support pin holes which extend transversely therethrough, said legs having upper portions inserted between the chords in said lower pair and lower portions extending below said structure to provide support therefor, and said legs being vertically reciprocally movable relative to said structure for adjusting the combined height thereof,

the strut pairs in said series each being adapted for inserting one of said legs between the struts of and at the apex of the strut pair, said legs being inserted between said struts in



respective selected strut pairs and being insertable alternatively between the struts of other strut pairs and at other locations along the length of said structure for supporting the structure alternatively at said other locations,

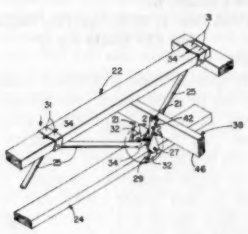
and means for supporting said structure on said legs adjustably at varying elevations including means carried by the chords in said lower pair and defining support pin holes, said hole-defining means being adapted for disposing the pin holes thereof on opposite sides of each leg for registry with said leg pin holes successively in any of said locations of the leg, and a support pin removably insertable through a selected one of said pin holes in each leg and through the pin holes of said hole-defining means in registry therewith for transferring the load forces from said hole-defining means to said legs.

4,106,257

COMPOSITE TRUSS BEARING CLIP

Tyrell T. Gilb, Berkeley, Calif., assignor to Simpson Manufacturing Co., Inc., San Leandro, Calif.

Filed Jun. 24, 1977, Ser. No. 809,529
Int. Cl.² E04C *3/02*
U.S. Cl. 52—693 **5 Claims**



1. A bridging clip for connecting composite trusses to a wood lateral brace and preventing rotation of the bottom chord wherein said trusses include a wood bottom chord, metal webs formed with a pin opening therethrough, and metal pins connected to said chords and extending through said web pin openings, said pins extend transversely to said chords and extend beyond both edges of said chords, said wood lateral brace is located parallel to said pins, within the intersecting metal webs and extend at right angles to said trusses; said clip comprises:

a. first and second identical elongated metal members each formed with a pin opening therethrough at a first end adapted for receiving and connection to opposite ends of said metal pin therethrough for transmitting loads from said wood brace to said chords and metal webs of said truss and for resisting rotation of said bottom chord from moment forces imposed by said metal webs on said metal pin; and a surface adjacent said opening adapted for engaging opposite edges of said wood chord;

b. each of said elongated clip members includes a second end formed with a plurality of fastener openings adapted for receiving fasteners for connecting said clips to said wood bracing member, and each member has a surface adjacent said fastener openings adapted for engaging opposite sides of said wood brace;

c. seat means formed in each of said clips adapted for engaging the lower edge of said wood brace; and

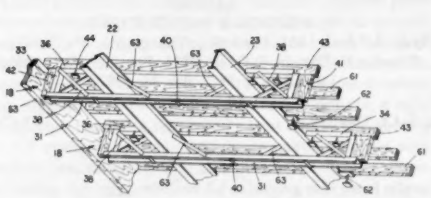
d. each of said elongated clip members extends from an end of said pin at substantially right angles thereto and said second ends of said clips are connected to said wood bracing member substantially vertically above the side edges of said chord.

4,106,258

MOBILE BUILDING FLOOR JOIST ASSEMBLY

Fredrick H. Lindsay, Rte. 1 Box 71, Darwin, Minn. 55324

Filed Jul. 5, 1977, Ser. No. 813,003
Int. Cl.² E04C *3/02*
U.S. Cl. 52—693 **2 Claims**



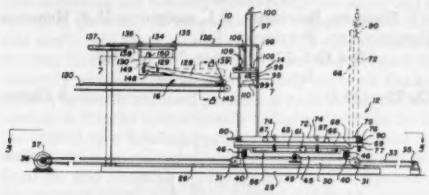
1. A composite wood and steel joist assembly comprising a horizontal steel channel member defining the lower margin of said joist assembly, upright steel channel members extending vertically from said horizontal member adjacent each of its ends, upper steel channel members extending a relatively short distance inwardly from each of said upright members, said upper members being axially aligned and parallel to said horizontal member, all of said steel channel members having their open side facing outwardly, a first unitary wooden member of rectangular cross-section nested within the bight of said horizontal channel member and extending beyond the ends thereof, a second unitary wooden member of rectangular cross-section spanning the upper channel members nested within the bight of said upper channel members and extending beyond the outer ends thereof, said first and second unitary members having slightly differing lengths to thereby laterally space their end margins and thus strengthen their juncture with adjacent structural members against vertical loading, and vertical wooden members nested within the bight of said upright channel members and disposed between the extending end portions of said first and second wooden members, whereby wood surfaces for accepting fasteners are presented outwardly around the complete perimeter of the joist assembly.

4,106,259

AUTOMATIC APPARATUS FOR LAYING BLOCK UNITS

Ernest J. Taylor-Smith, 2905 W. 37th Ave., Vancouver, B. C., Canada (V6N 2T8)

Filed Oct. 18, 1976, Ser. No. 733,155
Int. Cl.[2] E04G *21/22*
U.S. Cl. 52—749 26 Claims



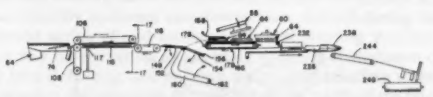
1. Apparatus for automatically laying block units to form a wall-like structure, comprising a table mounted for lateral movement and movement normal to said lateral movement and having a block unit receiving surface, means for moving block units in succession to a predetermined position near said table surface and respectively depositing said block units on the receiving surface at said position, means connected to the table to shift said table in said lateral movement a sufficient distance after each block unit is placed thereon to enable a course of block units to be formed on the table, and means connected to the table to shift said table in said normal movement a sufficient distance after each course of block units has been completed to enable a plurality of adjacent substantially parallel courses of said block units to be formed on the table.

4,106,260

ARTICLE FOLDING AND PACKAGING SYSTEM

J. Frank King, Winston-Salem, N.C., assignor to Hanes Corporation, Winston-Salem, N.C.

Filed Sep. 29, 1976, Ser. No. 727,756
Int. Cl.[2] B65B *63/04, 63/08;* B65H *45/18, 45/30*
U.S. Cl. 53—21 FW 12 Claims



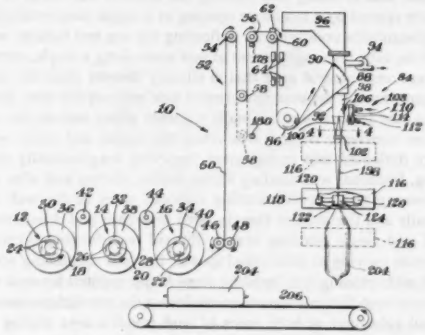
1. The method of folding an article about an insert as the article is advanced along a prescribed path comprising the steps of; initially positioning at rest a relatively flat flexible article having a first portion in generally parallel superposed spaced relation above an insert positioned at rest, and having a second portion depending below the insert, simultaneously initiating displacement of and advancing the article and insert at different rates generally along the prescribed path of travel while retaining the article first portion in superposed spaced relation above the insert to feed an edge of the insert into contact with the article second portion to initiate folding of the article transversely of the prescribed path of travel, feeding the insert and transversely folded article along the prescribed path of travel while folding the article longitudinally of said path of travel, and subsequently folding the article about the insert transversely of the prescribed path of travel.

4,106,261

METHOD OF FORMING, FILLING, AND SEALING SCRIM REINFORCED PLASTIC BAGS

Eddie Lee Greenawalt, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 8, 1977, Ser. No. 822,481
Int. Cl.[2] B65B *9/12, 41/16*
U.S. Cl. 53—27 5 Claims



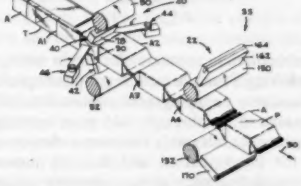
1. The method of preparing filled industrial size bags by the steps comprising: converting a scrim reinforced composite web into a tube having overlapped marginal edges, sealing the marginal edges together securing the scrim in the seal, thereafter periodically filling the tube with product and sealing the tube transversely about each successive product fill, securing the scrim also in the transverse seals, combined therewith, the further steps of preparing the composite web in line with the foregoing steps, and comprising the steps of unwinding a carrier ply comprising a plastic film from a wound up supply roll and training the carrier ply about the surface of revolution of a wound up roll of a continuous reinforcing scrim ply, drawing the carrier ply forward and causing it to travel about the surface of revolution of the scrim roll substantially without slippage, thereby tying the carrier ply by frictional surface contact to the scrim ply to provide substantially equal lengths of the scrim ply and the carrier plies in combined form, and applying a second plastic film to the opposite side of the scrim ply, said process being further characterized by the carrier ply comprising a ply of said filled industrial size bags.

4,106,262

WRAPPING MACHINE AND METHOD WITH FOUR SIDE ROTARY TUCKER

John S. Aterianus, Green Bay, Wis., assignor to FMC Corporation, San Jose, Calif.

Division of Ser. No. 581,993, May 29, 1975. This application Feb. 17, 1976, Ser. No. 658,448
Int. Cl.[2] B65B *9/10*
U.S. Cl. 53—28 1 Claim



1. In the method of packaging articles by continuously forming a strip of flat heat sealable material into a tube in which

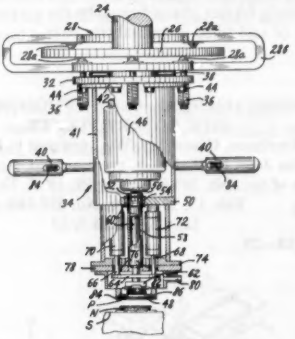
equally longitudinally spaced articles are inserted and transported by the tube, the tube defining top, bottom and side walls whose unoccupied longitudinally spaced portions are deflected toward the central axis of the tube by tucking members; the improvement in said method comprising the steps of simultaneously creasing the side walls of the tube inwardly at unoccupied portions of the tube substantially at the midplane of the tube, said creasing step leaving the creased side walls of the tube spaced by a minimum spacing at a single transverse zone, substantially concurrently deflecting the top and bottom walls of the tube into engagement at said zone along a single, narrow transverse central area that is slightly shorter than the minimum spacing between the creased side walls of the tube, bonding said top and bottom walls together along said single, narrow transverse central area when said upper and lower walls are deflected into engagement, applying longitudinally moving, frictional web feeding forces before, during and after said creasing steps to transversely opposed sides of the web side walls and the articles therein both upstream and downstream of said single bonding area with said web feeding frictional forces moving at differential speeds, the tube shortening action of said creasing and bonding steps being resisted by said frictional web feeding forces for rendering the creased portions of said tube taut at both sides of said bonded area during the creasing step, said web feeding frictional forces downstream of said bonding area accommodating longitudinal movement of the downstream article toward the upstream article during said creasing step, feeding the creased and bonded area to a position downstream of the position at which the creasing and bonding steps were performed, and transversely bonding and severing the entire width of the tube through the creased and previously bonded area between articles that have been fed to said downstream position.

4,106,263

APPARATUS FOR PRESSURE TESTING OF CONTAINERS

William A. Conrad, Pinole, Calif., assignor to Rheem Manufacturing Company, New York, N.Y.

Filed Jul. 18, 1977, Ser. No. 816,654
Int. Cl.² B65B *31/02*; G01M *3/32*
U.S. Cl. 53—97 **8 Claims**



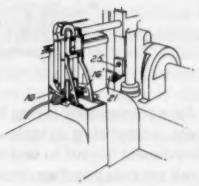
1. In combination, in apparatus for use in testing leakage in a container having a surface including a pour opening: housing means for sealably engaging said container surface and for issuing pressurized air through said pour opening into said container; means for releasably retaining a closure member and supported for movement in said housing means; actuator means for translating such closure member retaining means toward said pour opening on preselected pressurization of said container and drive means responsive to predetermined pressure-induced force on said closure member in such translation thereof and energizable thereby for imparting further movement to said closure member retaining means to secure said closure member to said pour opening.

4,106,264

APPARATUS FOR COMPRESSING AND HOLDING A HANKED PACKAGE OF FLEXIBLE MATERIAL DURING FASTENING

Harris F. Hanscom, Barrington, R.I., assignor to H. F. Hanscom & Company, Inc., Providence, R.I.

Filed Oct. 22, 1976, Ser. No. 735,028
Int. Cl.² B65B *13/20*
U.S. Cl. 53—124 D **9 Claims**



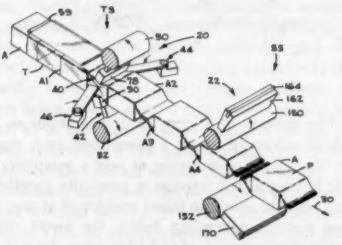
1. In a packaging mechanism, means for compressing a package comprising an upright stand, a pair of package engaging means pivoted on said stand with arms on one side of the pivot to engage the package and a second arm extending from the other side of the pivot, a bell crank lever pivoted on said stand and at a location spaced from the pivot of said package engaging means and having legs extending from its pivot, resilient means extending from said second arm to one of the legs, the other leg of the bell crank lever being engageable to swing it and move said second arm and the package engaging means into engagement with the package, hook means to hold said lever in package engaging position, means to wrap the package while engaged, means actuatable to release said hook means from engaging position and means to return said bell crank lever to preswung position.

4,106,265

WRAPPING MACHINE AND METHOD WITH FOUR SIDE ROTARY TUCKER

John S. Aterianus, Green Bay, Wis., assignor to FMC Corporation, San Jose, Calif.

Filed May 29, 1975, Ser. No. 581,993
Int. Cl.² B65B *9/10*, *51/30*
U.S. Cl. 53—180 R **1 Claim**



1. In a wrapping machine wherein a series of longitudinally spaced articles are inserted in a moving tube of wrapping material formed from a flat strip of thermoplastic material, said tube having top and bottom walls and side walls and being laden with such longitudinally spaced articles, means for feeding the laden tube along a longitudinal path, means for tucking the side walls of the tube portions between articles toward the longitudinal axis of the tube, rotary vertically spaced shafts located above and below the path of the tube, top and bottom

tube wall deflecting and bonding means mounted on said shafts, means for simultaneously rotating said shafts and tube deflecting and bonding means in opposite directions for simultaneously deflecting and bonding the top and bottom walls of the tube being fed therebetween at portions of the tube between articles, and means for transversely severing the tube at the bond; the improvement wherein said top and bottom tube wall deflecting and bonding means comprises upper and lower elongate, generally rectangular shoes respectively secured to said shafts, said shoes each having a single tube deflecting and bonding foot that cooperate at each bond, said feet each having convexly curved central tube bonding portions flanked by radially inwardly recessed portions at each side of the bonding portion to thereby cooperatively define end slots in the feet as the central tube bonding portions deflect the top and bottom walls of the tube, said slots being completely open and un-confined by said shoes at their ends and at their upstream and downstream edges, means for heating said feet to effect bonding of the deflected top and bottom walls of the tube by the central tube bonding foot portions along a single, relatively narrow transverse central area, said side wall tucking means comprising simultaneously rotatable shafts located adjacent opposite side walls of said tube, thin blade-like tucking shoes secured to and projecting from said shafts and rotating in a plane containing said slots, said tucking shoes having free end portions for simultaneously passing through their respective slots to tuck the tube side walls so that the innermost portion of each tuck is adjacent the ends of the associated central tube bonding portions of said feet substantially concurrently with the bonding operation, said tucking shoes being positioned so that a single end portion enters its respective slot during the deflection and bonding of the tube by the central portions of said feet, said tube feeding means comprising means for tensioning the unoccupied tube portions between articles for providing controlled deflection and tucking thereof, said tensioning means comprising longitudinally spaced pairs of laterally opposed belts making frictional contact with opposed walls of the tube, one pair of said belts being located upstream of said upper and lower tube wall deflecting and bonding means while the other pair is located downstream thereof, and means for driving said pairs of belts at different speeds for maintaining tension of said unoccupied tube portions between spaced articles and rendering said tube portions taut both upstream and downstream of the tucking and bonding means during the tucking and bonding operations at said tube portions, said downstream belts accommodating longitudinal movement of the downstream article toward the upstream article during said tube deflecting and tucking operations, said tucked side portions and said top and bottom wall portions of the tube being unconfined between the zone of said tucking shoes and bonding shoe portions and the ends of articles disposed directly upstream and downstream thereof during the aforesaid action of said tucking shoes and bonding shoe portions, said tube severing means being disposed downstream of said tube deflecting and bonding means and including means for bonding the tube walls entirely across the width of the tube.

4,106,266

ANIMAL HALTER

William T. Hibbert, Rte. 2, Box 44, Breckenridge, Tex. 76024

Filed Aug. 13, 1976, Ser. No. 714,140
Int. Cl.[2] B68B *1/02*
U.S. Cl. 54—24 **9 Claims**

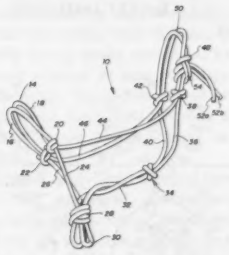
1. An animal halter, comprising:

a plurality of fixed length segments being formed from a single continuous length of line, said fixed length segments being formed and joined together by a plurality of non-slip knots;

an adjustable neck band segment being formed from said length of line and being joined together by an adjustable knot;

a lead loop being formed from said length of line for attaching a lead to the halter; and

said fixed length segments and said non-slip knots including a nose segment joined to a pair of frontal segments and a pair of cheek segments by two nose piece knots, said frontal segments extending to and being joined together by a lead knot, said lead knot being formed to include said lead loop, a chin segment extending from said lead knot to a chin knot to form said chin segment, a pair of throatlatch



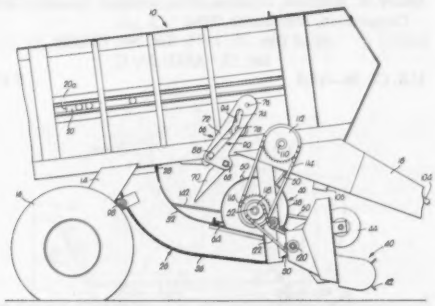
segments extending from said chin knot, each of said throatlatch segments extending to and being joined to one of said cheek segments at the end of said cheek segment distal from said nose segment, and said throatlatch segments being joined together by said adjustable neck band segment.

4,106,267

BALER LOADING METHOD AND APPARATUS

Allen Andrew White, Peabody, Kans., assignor to Hesston Corporation, Hesston, Kans.

Division of Ser. No. 675,529, Apr. 9, 1976. This application Mar. 16, 1977, Ser. No. 778,246
Int. Cl.[2] A01D *91/00*
U.S. Cl. 56—1 **9 Claims**



1. In a baling method, the improvement of:

in alternating steps, stuffing successive charges of predetermind size and density into a baling chamber and compacting the same within said chamber;

temporarily interrupting at least said stuffing if the charge to be stuffed and compacted is less than said predetermined size and density;

resuming said alternate stuffing and compacting when the deficiency in the charge is eliminated,

said steps being carried out while the baling chamber is advancing; and

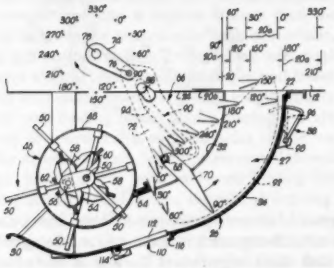
the additional step of continuously picking up material from the ground for charging the chamber as the latter advances.

4,106,268

METHOD FOR LOADING AND BALING CROP MATERIAL

Allen A. White, Peabody; Cecil L. Case, Newton; Thomas W. Ankenman, Hesston, and George Yatcilla, Newton, all of Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed Nov. 1, 1976, Ser. No. 737,472
Int. Cl.[2] A01D *91/00*
U.S. Cl. 56—1 **5 Claims**



1. In a method of baling a volume of material supplied at an irregular rate, the steps of:

continuously reciprocating a compacting plunger in a baling chamber;

stuffing successive charges of the material into the chamber in timed relation to reciprocation of the plunger and at the rate of one stuffing stroke per each cycle of the plunger;

checking the size and density of the next charge before each stuffing stroke; and

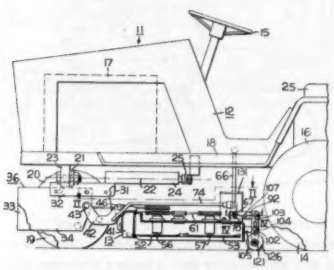
if the next charge has not yet reached a predetermined size and density, skipping one or more stuffing strokes relative to the continuously moving plunger until the desired size and density have been achieved.

4,106,269

ADJUSTABLE GROUND ROLLER FOR MOWER

Henry T. Knudson, Grafton, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 30, 1976, Ser. No. 755,464
Int. Cl.[2] A01D *55/32*
U.S. Cl. 56—15.8 **5 Claims**



1. In combination with a mower including a housing for blade means, a side-to-side leveling mechanism comprising

a rock shaft mounted on said housing for pivotal movement about an axis extending transverse to the direction of movement of said housing during a mowing operation,

a manual control level connected to said rock shaft,

transversely spaced ground rollers adjacent one of the fore and aft sides of said housing,

a pair of arms secured to transversely spaced points of said rock shaft for swinging movement therewith and connected to said rollers, one of said arms having first and second angularly adjustable parts in side-by-side relation to one another, said first part being rigidly secured to said rock shaft, and

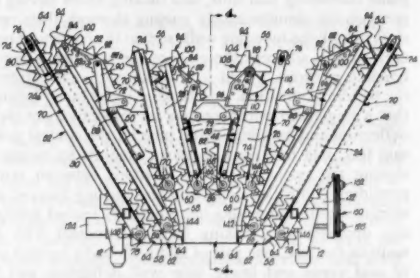
fastening means releasably securing said parts together, said parts being angularly adjustable relative to one another upon loosening of said fastening means.

4,106,270

FOUR ROW FORAGE HARVESTER

Rex Olen Weigand, Newton; Kenneth Ray McMillen, Canton; Ronald Dean Fulk, Hesston; Daniel Ray Prichard, and Jack Merriel Kountz, both of Wichita, all of Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed Apr. 20, 1976, Ser. No. 678,674
Int. Cl.[2] A01D *45/02*
U.S. Cl. 56—98 **17 Claims**



1. In a forage harvesting header having a lower front end and an upper rear end with respect to the normal direction of travel of the header:

structure defining a crop discharge zone at said upper rear end of the header;

a pair of elongated, outer, crop-gathering units diverging downwardly and forwardly from said structure for conveying stalks of severed crop material upwardly and rearwardly to said zone from the front end of the header;

at least one middle crop-gathering unit between said outer units and extending downwardly and forwardly from said structure,

said units each having generally fore-and-aft extending, laterally separated, cooperating conveying elements at one level and defining a crop-conveying passage therebetween that follows the longitudinal axis of its unit,

each passage having a standing crop inlet adjacent said front end of the header and a severed crop outlet adjacent said rear end of the header;

crop cutter means located adjacent said inlets of the passages for severing standing crops entering the same during advancement of the header,

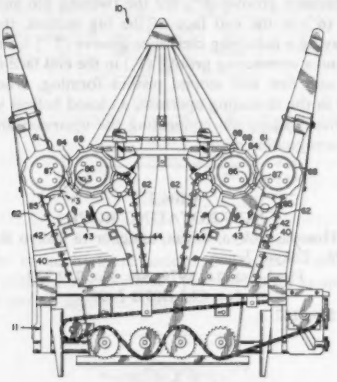
said passage of the middle unit having its outlet to said zone spaced forwardly from the outlets of the passages of said outer units, and said elements of the outer units being disposed above and at least partially overlapping elements of said middle unit adjacent said outlet of the middle unit; and

means associated with said units for leaning back the severed stalks of all units as they approach said zone and for leaning inwardly toward one another the severed stalks of said outer units as they approach said zone whereby to assist in the clog-free conveyance of the severed stalks in a butt-first attitude through said zone.

4,106,271
ROTARY KNIFE STRIPPER

Thomas A. Carey, Plainfield, and George W. Ridge, La Grange, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Apr. 6, 1977, Ser. No. 785,131
Int. Cl.[2] A01D *45/00*
U.S. Cl. 56—119 5 Claims

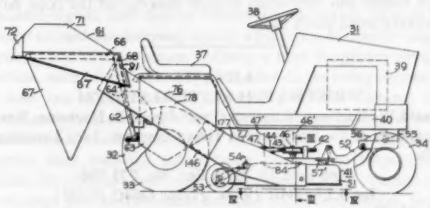


1. In a row crop harvesting header, said header comprising a frame structure defining at least one crop gathering passage opening forwardly along the line of travel of said header, crop cutting means and crop conveying means for severing a crop stalk from the ground and moving it rearwardly in said passage to the rearward portion of said header, said crop cutting means including upper and lower rotary cutting disks mounted respectively on each side of said passage, a portion of said upper disk overlapping a portion of said lower disk to define a crop cutting nip, the improvement comprising a stripper plate mounted on said frame structure rearwardly of said cutting nip, said stripping plate having an arcuate stripping edge closely adjacent to but spaced from the periphery of said lower disk and extending from a forward portion underlapping said upper disk to a point outside of said crop passage.

4,106,272
GRASS COLLECTING MULTIPLE BLADE MOWER WITHOUT AUXILIARY BLOWER MEANS

James F. Peterson, Cedarburg; Edward Freier, Jr., Port Washington, and Gerald C. Burmesch, Belgium, all of Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 6, 1976, Ser. No. 747,694
Int. Cl.[2] A01D *35/22*
U.S. Cl. 56—202 9 Claims



1. In combination with a tractor, having traction wheels for moving the tractor in a forward direction,

a downwardly opening, mower housing suspended from said tractor having top, front and rear walls, a sidewall at one lateral side thereof and a lateral discharge opening in the other lateral side thereof,

a pair of horizontally disposed blades rotatably mounted on said housing for rotation about laterally spaced vertical axes, said axis disposed closest to said discharge opening being spaced rearward of the other axis, said blades having lift portions to generate air movement,

a grass catcher supported on the rear of said tractor including vent means permitting a high volume flow of air therefrom, and

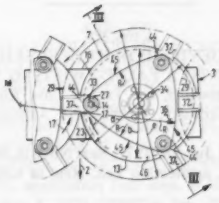
conduit means interconnecting said discharge opening and said grass catcher including walls defining an elbow part having a laterally facing intake opening at its front end in generally aligned relation to said discharge opening of said housing, the major dimension of said intake opening being in a longitudinal, horizontal direction and the minor dimension of said intake opening being in a generally vertical direction,

said wall defining said elbow part sloping upwardly, laterally outwardly and rearwardly immediately from said intake opening to present a rearward facing opening, said elbow part having an elliptical cross-section from a portion thereof relatively near its intake opening through a predetermined number of degrees constituting a major portion of its curvature and wherein the major axis of said elliptical cross-section slopes upwardly in a radially outward direction at a gradually increasing pitch from a cross-section near said intake opening to a cross-section at said predetermined number of degrees therefrom.

4,106,273
MOWER

Pieter Adriaan Oosterling, and Hendricus Cornelis van Staveren, both of Nieuw-Vennep, Netherlands, assignors to Multinorm, B.V., Nieuw-Vennep, Netherlands

Filed Mar. 3, 1977, Ser. No. 774,052
Claims priority, application Japan, Mar. 17, 1976, 51-02802
Int. Cl.[2] A01D *55/18*
U.S. Cl. 56—295 3 Claims



1. A mower comprising a housing extending transversely of the direction of movement of the mower, a plurality of cutting members rotatably journalled on said housing and a driving gear assembly accommodated within said housing and adapted to drive the cutting members, each cutting member comprising at least one lower ring sweeping over the housing, an upper ring arranged above the lower ring, and three pins extending between said upper and lower rings and circumferentially spaced therearound, and three cutters fastened each to a pin between the upper ring and the lower ring, the cutters of neighbouring cutting members being relatively off-set in the circumferential direction, whilst at the area of the path of each cutter of a neighbouring cutting member the lower ring of each cutting member is not covered, characterized in that the upper ring has essentially the shape of a triangle having rounded-off corners, in which the cutters are secured.

4,106,274

YARN TEXTURING MACHINE

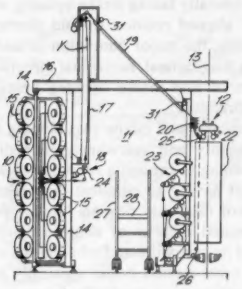
Ronald Spencer Eaves, Chapel-en-le-Frith, England, assignor to Ernest Scragg & Sons Limited, Macclesfield, England

Filed Mar. 21, 1977, Ser. No. 779,938

Claims priority, application United Kingdom, Mar. 23, 1976, 11595/76

Int. Cl.[2] D01H *13/28;* D02G *1/02*

U.S. Cl. 57—34 HS 3 Claims



1. In a yarn texturing machine, a combination comprising a creel section comprising at least one upright row of yarn supply packages, said row having an upper and a lower end; a texturing section comprising package winders and at least one false twister, said false twister being located not higher than said upper end and said texturing section being on the same level as and transversely spaced from said creel section and defining therewith an operator aisle; at least one upright setting heater mounted adjacent to said creel section and having an outlet upwardly spaced from said upper end and an inlet located substantially midway between said upper and lower ends so that yarn from the supply packages above said inlet runs down to the same and yarn from the supply packages below said inlet runs up to the same; and at least one elongated yarn stabilizing and cooling guide spanning said aisle and extending from the vicinity of said outlet downwardly to said false twister, whereby the overall height of said machine is less than the combined heights of said row and said heater and the yarn is positively guided over substantially the entire distance from said inlet to said false twister.

4,106,275

PROCESS AND DEVICE FOR HIGH SPEED THREADING OF YARN INTO A FALSE-TWISTING SPINDLE

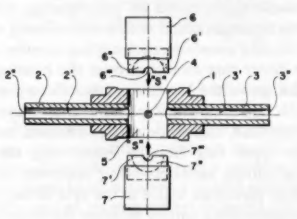
Josef Fitzner, Erlenbach, and Lothar Löw, Elsenfeld, both of Fed. Rep. of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Filed Jul. 18, 1977, Ser. No. 816,565

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1976, 2634492

Int. Cl.[2] D01H *13/04;* D02G *1/04*

U.S. Cl. 57—77.33 2 Claims



2. A thread in device for a false-twist spindle having a rotor body and an upstream pipe and downstream pipe, a twisting pin aligned in the rotor body with the upstream and downstream pipe, a cylindrical threading aperture through the rotor and in perpendicular alignment with the threading pin, the upstream and downstream pipes forming yarn guiding ducts to the twisting pin, comprising first and second pistons (6 and 7), each piston having a lug section with its outer surface matching the cylindrical threading aperture, the first piston (6) having a clearance groove (6‴) for the twisting pin and parallel grooves (6″) in the end face of the lug section, the second piston having a matching clearance groove (7‴) for the twisting pin and a connecting groove (7″) in the end face of the lug section, said first and second pistons forming, when joined together in the threading aperture, a closed helical yarn path around the twisting pin connecting the upstream and downstream yarn guiding ducts.

4,106,276

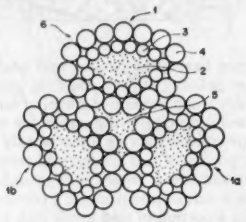
NON-ROTATING ROPE

Kiyoshi Hosoya, Tokyo, Japan, assignor to Tokyo Rope Mfg. Co. Ltd., Tokyo, Japan

Filed Oct. 14, 1976, Ser. No. 732,337

Int. Cl.[2] D07B *1/08*

U.S. Cl. 57—147 4 Claims



1. A clam-shaped-strand non-rotating rope in which three strands, each composed of plural layers of wires stranded in the same direction around a core made of flexible material, are arranged in a single layer around the periphery of a core made of the same material as that of said core and closed in a direction opposite to the direction of lay of said strands, which have clam-shaped sections in the planes normal to the rope axis and principal axes on the equiangularly spaced radial lines, and which are so disposed equidistantly from the rope center as to be in contact with one another at each side thereof with the apex and base of each clam directed inwards and outwards respectively thereby reducing the pitch radius Rs of each strand and making the rotational moment Mw of the wires of each strand approximate the rotational moment Ms of the strand, said rope further defined by having a relatively small pitch radius and individual strands making up the rope have relatively small pitch radii.

4,106,277

WRISTWATCH SETTING SYSTEM

Donald W. Garrison, Lancaster, and James T. Hartman, Reading, both of Pa., assignors to Time Computer, Inc., Lancaster, Pa.

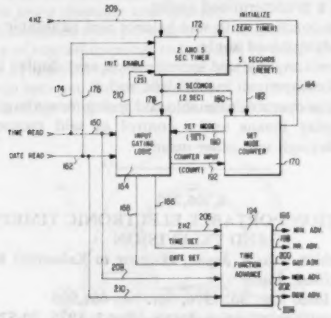
Filed Feb. 23, 1977, Ser. No. 771,096

Int. Cl.[2] G04B *19/24, 27/00;* G04C *19/00*

U.S. Cl. 58—4 A 20 Claims

1. A solid state wristwatch comprising a source of substantially constant frequency electrical signals, a divider coupled to said source for reducing the frequency of the electrical signals, a display actuator coupled to said divider for producing both time and date electrical signals, an active digital display coupled to said actuator, a manually operated time demand switch in said watch for coupling time information from said actuator

to said display, a manually operated date demand switch in said watch for coupling date information from said actuator to said display, a source of setting signals in said watch, and means



responsive to multiple actuations of at least one of said switches within a predetermined time period for coupling said source of setting signals to said display.

4,106,278

ELECTRONIC TIMEPIECE UTILIZING SEMICONDUCTOR-INSULATING SUBSTRATE INTEGRATED CIRCUITRY

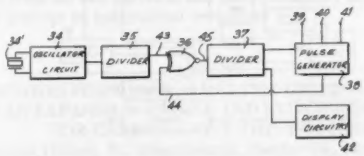
Hirofumi Yasuda, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Dec. 18, 1975, Ser. No. 642,047

Claims priority, application Japan, Dec. 18, 1974, 49-146043

Int. Cl.[2] G04C *3/00;* **H01L** *27/02*

U.S. Cl. 58—23 A **18 Claims**



1. An electronic timepiece comprising oscillator means including a quartz crystal vibrator high frequency time standard having a resonant frequency of vibration of at least 500 KHz and an inverter stage coupled to said high frequency time standard, said oscillator means producing a high frequency time standard signal, divider means including a plurality of series-connected divider stages for producing a low frequency timekeeping signal in response to said high frequency time standard signal, and display means for displaying time in response to said timekeeping signal, a plurality of divider stages forming said divider means defining a high frequency divider portion, each of said plurality of divider stages being formed of at least one complementary coupled pair of P-channel and N-channel conductive field-effect transistors having a semiconductor-insulating substrate construction, said high frequency time standard signal being coupled to respectively commonly coupled drain and gate terminals of a P-channel and N-channel pair of transistors defining the inverter stage, and a feedback resistor means coupled in parallel with said quartz crystal vibrator, said oscillator means including capacitance means coupled between said commonly coupled gate and drain terminals of said P-channel and N-channel transistor pairs, and a reference potential, said inverter stage including source resistance means coupled intermediate the source electrode of each P-channel and N-channel transistor and a reference potential.

4,106,279

WRIST WATCH INCORPORATING A THERMOELECTRIC GENERATOR

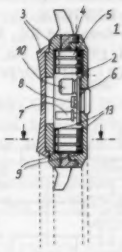
Jean-Claude Martin, and Christian Piguet, both of Neuchatel, Switzerland, assignors to Centre Electronique Horloger S.A., Neuchatel, Switzerland

Filed May 6, 1976, Ser. No. 683,949

Claims priority, application Switzerland, May 7, 1975, 5879/75

Int. Cl.[2] G24C *5/00*

U.S. Cl. 58—23 BA **9 Claims**



1. An electric wrist watch comprising a case, a display device, a time-keeping unit, an electrical energy storage device and a thermoelectric generator, said wrist watch including at least two parts separated from each other by a thermally insulating joint and connected to the thermoelectric generator, the said at least two parts being arranged to be at least temporarily at different temperatures from one another and comprising portions of said case, the first of said parts forming a thermal exchanger serving as a cold source and positioned to be in contact with the ambient air when the wrist watch is worn, the second of said parts forming a thermal exchanger serving as a hot source and positioned to be in contact with the wrist of the wearer when the wrist watch is worn, the watch further including means within said case defining a ring-shaped space, said thermoelectric generator being mounted within the ring-shaped space, one surface of said thermoelectric generator being in thermal contact with an upper part of said case, the other surface of said thermoelectric generator being in thermal contact with the lower portion of said case.

4,106,280

METHOD AND APPARATUS FOR SYNCHRONIZING A MECHANICAL OSCILLATING SYSTEM TO THE ACCURACY OF A QUARTZ STANDARD

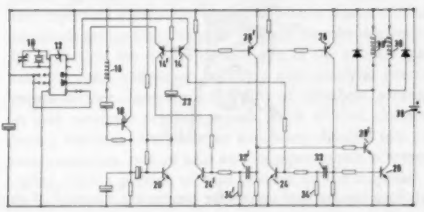
Hansrichard Schulz, Obere Waldstr. 2a, D-7730 VS-Villingen, and Herbert Hummel, Am Hummelberg 16, D-7732 Niederechach, both of Fed. Rep. of Germany

Filed Mar. 24, 1976, Ser. No. 670,003

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1975, 2513583; Sep. 6, 1975, 2539774; Jan. 22, 1976, 2602226

Int. Cl.[2] G04C *3/02, 3/04, 5/00*

U.S. Cl. 58—28 R **32 Claims**



1. A method of indirect synchronization of a mechanical

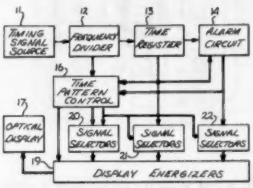
oscillating system to the accuracy of a quartz standard, in particular the timing control of a clock, comprising the steps of: generating timing pulses from a quartz oscillator; deriving an existing-value signal from said oscillating system; comparing said existing-value signal with said timing pulses by a phase comparison and detecting frequency deviations of said existing-value signal; and adjusting the frequency of said mechanical oscillating system dependent on the deviations detected.

4,106,281

TIME DISPLAYS FOR ELECTRONIC TIME KEEPING DEVICES

Alfred B. Freeman, 20418 Seaboard Rd., Malibu, Calif. 90265

Filed Jun. 28, 1976, Ser. No. 700,127
Int. Cl.[2] G04B *19/24*
U.S. Cl. 58—50 R **13 Claims**



12. In an electronic time keeping device having a time signal source and a time register holding the time in electrical form, the combination of:

(a) a plurality of optical display elements located around a loop on the face of said time keeping device;

(b) means coupled to said elements for energizing said elements responsive to signals identifying those of said elements to be energized;

(c) first means coupled to said timing signal source and to said time register for applying to said energizing means signals identifying those of said elements at the hour and 5 minute positions held in said time register; and

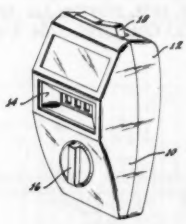
(d) second means coupled to said timing signal source and to said time register for applying a sequence of signals repetitively a plurality of times per minute to said energizing means, said sequence of signals identifying a number of said elements corresponding to the number of minutes from the 5 minute position held in said time register.

4,106,282

ESCAPEMENT MECHANISM FOR WATCH

Ake Lennart Larsson, Palos Verdes Estates, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Filed Nov. 26, 1976, Ser. No. 745,071
Int. Cl.[2] G04F *7/04;* **G04C** *3/00;* **G04B** *15/00*
U.S. Cl. 58—74 **4 Claims**



1. In a mechanical watch for measuring a period of elapsed time, the combination comprising:

a housing having a display window;

spring means within the housing;

windup means for winding said spring means;

an output display means for indicating the elapsed time measurement;

an escapement mechanism having a balance pivotable through a predetermined angle;

cam means coacting with said balance and adjustable to set said predetermined angle;

other means coupling said spring means, said display means and said escapement mechanism; and

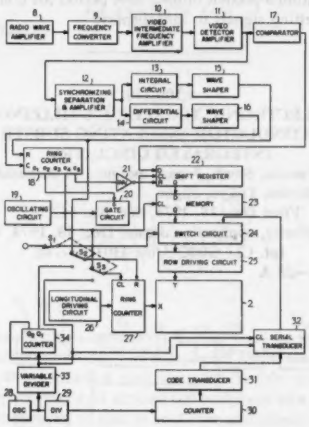
switch means operable to enable said spring means to actuate said display means under control of said escapement means through said other means.

4,106,283

COMBINATION PORTABLE ELECTRONIC TIMEPIECE AND TELEVISION

Shiro Yamashita, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Apr. 30, 1976, Ser. No. 681,905
Claims priority, application Japan, May 1, 1975, 50-52842
Int. Cl.[2] G04C *3/00, 17/00, 23/00*
U.S. Cl. 58—152 R **5 Claims**



1. A portable electronic timepiece comprising: electronic time-keeping means for developing electric time signals suitable for use as a time standard; receiving means for receiving a telecast video signal and developing therefrom electric video signals representative of the video information contained in the telecast video signal; indicating means receptive of the electric time signals and the electric video signals for selectively visually displaying an image of the time and of the video information; and switching means coacting with said time-keeping means and said receiving means for selectively switching the electric time and video signals to said indicating means to thereby select either the time image or the video information image to be displayed by said indicating means.

4,106,284

SPRING-BIASED SPLIT-SLEEVE COUPLING PIN RETAINER

Edward J. Crook, Jr., Tulsa, Okla., assignor to American Hoist & Derrick Company, Tulsa, Okla.

Filed Aug. 8, 1977, Ser. No. 822,734
Int. Cl.[2] F16G *15/04*
U.S. Cl. 59—85 **11 Claims**

1. A coupling link comprising, in combination:

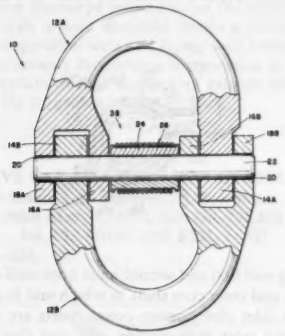
(a) a first and a second half link, each half link comprising a U-shaped member, each of the ends of each of said U-shaped members having at least one ear, each of the plurality of ears having an opening therethrough, the axes of

the plurality of openings substantially perpendicular to the arms of said U-shaped members;

(b) said plurality of ears adapted to interact with each other so that the openings through said at least four ears will be the same diameter and coaxial;

(c) a hardened steel pin adapted to be received in said plurality of coaxial openings to lock said two half links together;

(d) a cylindrical spacer of length slightly less than the dimension between the parallel faces of the two inner ears of said plurality of ears, having an axially opening substantially



equal in diameter to that of said pin; said spacer cut along a diametral plane into two similar halves each slightly thinner than a semi-cylinder; and

(e) spring means surrounding said cylindrical spacer, adapted to press said two halves together, forming a pin retaining means;

whereby when said pin retaining means is placed between the inner pair of ears, and said pin is inserted through the openings in said ears and through said retaining means, said spring means will press the two halves of said spacer to tightly grip said pin, and prevent its longitudinal movement.

4,106,285

METHOD FOR REGULATING THE DRIVING POWER OF AN EXPANSION ENGINE AND EXPANSION ENGINE FOR CARRYING OUT THIS PROCESS

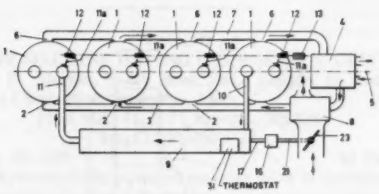
Cornelis Hubers, 11, Slingerlaantje, Harderwijk, Netherlands

Filed Nov. 12, 1975, Ser. No. 631,404

Claims priority, application Netherlands, Nov. 20, 1974, 7415108

Int. Cl.² F02G *3/02*

U.S. Cl. 60—39.63 **7 Claims**



1. Expansion engine apparatus comprising

an expansion engine;

a separate combustion device having inlets for combustion air and for fuel, an ignition device for igniting said fuel, and an outlet for combustion gas connected to a combustion gas inlet on said expansion engine;

a supercharger for precompressing combustion air;

a cooling device connected to receive said combustion air from said supercharger and supply said combustion air to said combustion device through said inlet for combustion air in said combustion device, and also having an inlet and an outlet for a cooling medium;

characterized by

a sensitive element influenced by changes in said combustion gas in said combustion device;

and a cooling air control means disposed in said inlet for said cooling medium of said cooling device and actuated by said sensitive element, for cooling said combustion air precompressed by said supercharger and supplied to said combustion device to maintain the pressure of the combustion gas substantially constant within the normal power region of the expansion engine apparatus.

4,106,286

WASTE HEAT RECOVERY BOILER APPARATUS

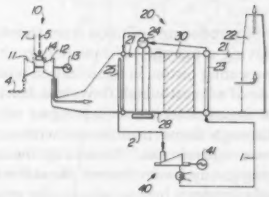
Akira Sakai; Taiji Inui, both of Hitachi, and Yasuaki Yokoi, Nagoya, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Sep. 24, 1976, Ser. No. 726,186

Claims priority, application Japan, Sep. 29, 1975, 50-116474

Int. Cl.² F01N *3/08*

U.S. Cl. 60—39.18 B **11 Claims**



1. A waste heat recovery boiler apparatus for generating steam by utilizing the heat of exhaust gases of a gas turbine machine, comprising:

passage means connected at one end thereof to the gas turbine machine, said exhaust gases passing through said passage means;

means, arranged in said passage means, for preheating feed water;

evaporator means, arranged in said passage means and disposed on the upstream side of said preheater means, for vaporizing the preheated feed water;

means, arranged in said passage means and disposed on the upstream side of said evaporator means, for super heating the vaporized saturated steam to generate super heated steam;

means, arranged in a zone in said passage means and adjacent to said evaporator means, for removing oxides of nitrogen from the exhaust gases, said exhaust gases in said zone having a temperature in the range between 300° and 400° C;

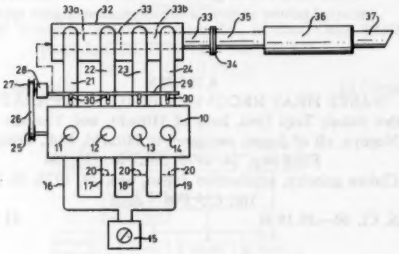
means, arranged in said nitrogen oxide-removing means, for injecting ammonia gas into the exhaust gases; and

catalytic reaction means, arranged in said nitrogen oxide-removing means and disposed on the downstream side of said injection means, for reaction with a mixture of said ammonia gas and said exhaust gases to thereby decompose by reduction the oxides of nitrogen in the exhaust gases into nitrogen and steam, wherein said catalytic reaction means further comprises a plurality of chambers, arranged in said catalytic reaction means, each of said chambers havng therin a catalyst layer and being divided into two compartments, one of said two compartments communicating with a portion of said passage means disposed on the upstream side of said nitrogen oxide-removing means and the other of said two compartments communicating with a portion of said passage means disposed on the downstream side of said nitrogen oxide-removing means.

4,106,287
REDUCING POLLUTION FROM INTERNAL COMBUSTION ENGINES

Michel Auclair, and Louis Le Parmentier, both of Mont-Saint-Aignan, France, assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Feb. 2, 1976, Ser. No. 654,480
Claims priority, application France, Feb. 3, 1975, 75 03198
Int. Cl.[2] F02B *75/10*; F01N *3/10*
U.S. Cl. 60—274 **27 Claims**



1. A method for reducing pollution from an internal combustion engine having a plurality of cylinders each of which includes a reciprocating piston, in combination with a reactor for the combustion of exhaust which flows in a downstream direction from said engine, said reactor having an outlet zone communicating through flame trap means with an exhaust discharge aperture wherein said flame trap means retains the flame of burning gas upstream thereof, the method comprising: burning in one cylinder a fuel-air mixture for producing a rich exhaust gas containing sufficient combustible matter for combustion when mixed with oxygen-containing gas; burning in the other of said cylinders a fuel-air mixture for producing a lean exhaust gas containing insufficient combustible material for combustion when mixed with oxygen-containing gas; conducting said rich exhaust gas into a first communicating region within said reactor adjacent said flame trap means to form a stratum of burning rich exhaust gas; conducting said lean exhaust gas into a second communicating region within said reactor located in a direction downstream from said first communication region in the direction of flow of said exhaust from said flame trap to said exhaust discharge aperture; exhausting said lean exhaust gas through said discharge aperture including passing said lean exhaust gas through said first communicating region in contact with said stratum of burning rich exhaust gas; mixing oxygen-containing gas with said rich and lean exhaust gases for combusting said combustible material in said rich exhaust gas and enhancing combustion of said combustible material in said lean exhaust gas; and thereafter discharging exhaust gas substantially depleted of combustible material through said outlet zone and said exhaust discharge aperture.

4,106,288
EXHAUST GAS REACTOR FOR INTERNAL COMBUSTION ENGINE AND ITS MANUFACTURING METHOD

Hatuo Nagaishi, and Tooru Yoshimura, both of Yokosuka, Japan, assignors to Nissan Motor Company, Limited, Japan

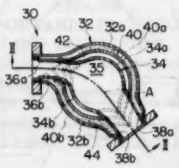
Filed Sep. 16, 1976, Ser. No. 723,949
Claims priority, application Japan, Oct. 13, 1975, 50/123508
Int. Cl.[2] F01N *3/10*
U.S. Cl. 60—282 **16 Claims**

1. A method of making a reactor including an outer shell, an inner core shell in said outer shell and spaced apart from the inner surface of said outer shell to form a space therebetween, said inner core shell defining therein a reaction chamber and having an inlet pipe portion and an outlet pipe portion, and an outer core shell disposed in said space to divide said space into two chambers, said outer core shell being secured to the outer surface of said inner core shell, comprising the steps of:

forming separately first and second outer shell counterparts;

forming separately first and second inner core shell counterparts, said first inner core shell counterpart having a first integral inlet pipe portion counterpart and a first integral outlet pipe portion counterpart and said second inner core shell counterpart having a second integral inlet pipe portion counterpart and a second integral outlet pipe portion counterpart;

forming separately first and second outer core shell counterparts;



combining said first and second inner core shell counterparts to form said inner core shell, in which said first and second integral inlet pipe portion counterparts are combined to form said inlet pipe portion and said first and second integral outlet pipe portion counterparts are combined to form said outlet pipe portion;

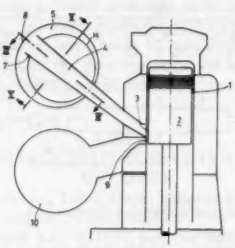
securing said first and second outer core shell counterparts to the outer surface of at least one of said inlet pipe or outlet pipe portions of said combined inner core shell, combining said first and second outer core shell counterparts to form said outer core shell; and

combining said first and second outer shell counterparts, securely disposing said formed inner core shell with said formed outer core shell.

4,106,289
EXHAUST SYSTEM IN A TWO-STROKE-CYCLE MULTICYLINDER INTERNAL COMBUSTION ENGINE

Eglof von Schnurbein, Augsburg; Jakob Bucher, Bobingen, and Thomas Mikota, Wulfertshausen, all of Fed. Rep. of Germany, assignors to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Augsburg, Fed. Rep. of Germany

Filed Oct. 20, 1975, Ser. No. 624,232
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1974, 2449628
Int. Cl.[2] F02B *27/04*; F01N *7/10*
U.S. Cl. 60—314 **10 Claims**



1. In a two-stroke-cycle multicylinder internal combustion engine having an exhaust port provided for each cylinder and having connecting exhaust ducts, each individual to a single cylinder of the engine, running between the exhaust port of said cylinder and a substantially cylindrical common exhaust discharge manifold, the improvement wherein each connect-

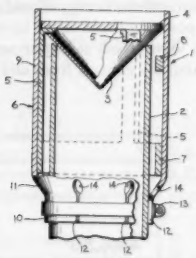
ing exhaust duct (4, 24, 35) is extended to as to project into the manifold (5, 25, 36) to such an extent that the portion of the duct that projects into the manifold has an end (7) therein, extends therein for a length not less than half the diameter of the manifold and, at least in the region of said portion, has a continuously broadening cross-section, and wherein said portion is directed substantially perpendicularly to the axis (A—A) of the manifold and has an opening transverse to the duct axis at said end (7) which opens into said manifold and wherein, further, said manifold has a wall facing said open end of each connecting exhaust duct, and at least said open end (7) of each connecting exhaust duct (4, 24, 35), by reason of the amount of free discharge area between the exhaust duct and said facing wall of said manifold, forms a pressure-gradient diffusor in cooperation with said facing wall acting as a baffle, the said continuously broadening cross-section in at least said projecting portion of each connecting exhaust duct also contributing to the formation of said diffusor.

4,106,290

PROTECTIVE CAP ASSEMBLY FOR AN EXHAUST PIPE

Donald E. Johnson, 2208 Highway 51, Stoughton, Wis. 53589

Filed May 18, 1977, Ser. No. 798,250
Int. Cl.[2] F01N *7/00*; **F23L** *17/02*
U.S. Cl. 60—324 **10 Claims**



1. A protective cap assembly to be attached to a vertical exhaust pipe, comprising an inverted conical cap disposed to engage the upper end of the exhaust pipe to seal the exhaust pipe when gas is not flowing through the pipe, support means connected to the cap and extending downwardly along the outer surface of the exhaust pipe, flow of gas within the exhaust pipe lifting the cap from the end of said exhaust pipe, stop means to limit the upward movement of the cap, and a housing located radially outward of said exhaust pipe, said housing having an upper end extending upwardly above the level of the cap when the cap is in sealing relation to the exhaust pipe and said housing have a lower portion disposed to be attached to said exhaust pipe.

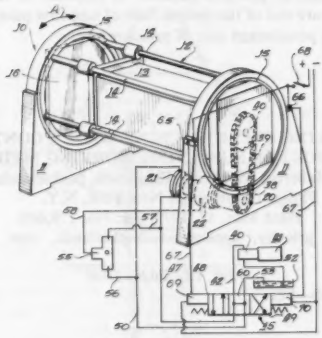
4,106,291

CORE MACHINE HAVING HYDROSTATIC DRIVE

George H. Morgan, South Bend, Ind., assignor to Lambert Brake Corporation, St. Joseph, Mich.

Filed Mar. 31, 1977, Ser. No. 783,325
Int. Cl.[2] F15B *15/18*
U.S. Cl. 60—369 **10 Claims**

1. A hydrostatically powered machine drive in combination with a machine having a fixed carriage and an assembly movable on the carriage, the drive comprising a reversible fluid power motor having an output shaft and fluid power means for rotating the output shaft in either of two directions; a failsafe fluid power brake having a brake shaft directly coupled with the motor output shaft, brake means for selectively engaging the brake shaft and retarding brake shaft rotation, means normally urging the brake means into engagement with the brake shaft for normally retarding brake shaft rotation and selectively energizable fluid power brake override means for overriding the brake-urging means so as to disengage the brake means and permit free brake shaft rotation when the fluid power override means is energized; transmission means having a drive shaft directly coupled with the brake shaft and means operatively coupled with the movable assembly to transmit motion from the motor output shaft and brake shaft to the movable assembly; and fluid power circuit means for powering said machine drive and including a source of pressurized fluid and conduit means for selectively leading the pressurized fluid from the source to the brake override means to permit free brake shaft rotation and for leading pressurized fluid from the



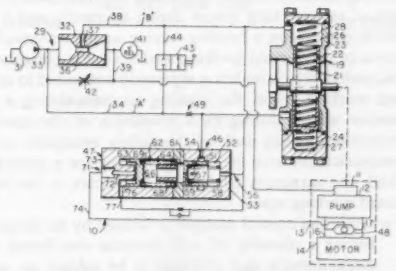
source to the fluid power motor to drive the fluid power motor output shaft, the brake shaft and the transmission means drive shaft so as to move the machine movable assembly upon the fixed carriage, withdrawal of fluid power pressure to the fluid power motor and brake override means operating to terminate motor driving action on the motor output shaft and to allow engagement of brake means with the brake shaft means so as to halt motion of the movable assembly and to precisely fix the movable assembly in a stationary position on the machine carriage.

4,106,292

SPEED AND LOAD RESPONSIVE UNDERSPEED ACTUATOR FOR HYDROSTATIC TRANSMISSIONS

Cyril W. Habiger, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jun. 16, 1977, Ser. No. 807,278
Int. Cl.[2] F16H *39/46*
U.S. Cl. 60—447 **9 Claims**



1. A control system for controlling the displacement of a first pump driven by a prime mover, comprising:

control means for controlling the displacement of said first pump;

an underspeed actuator having a piston, first and second actuating chambers at opposite ends of said piston, and biasing means, said piston being connected to the control means and movable between a first position at which said first pump is at minimum displacement and a second posi-

tion at which said first pump is at maximum displacement, said biasing means urging the piston toward the first position, and said piston being movable between said first and second positions in response to pressure differential in said first and second chambers;

signal means for controllably developing first and second control signals in response to the operating speed of the prime mover and delivering said first and second signals to respective first and second chambers; and

first means for controllably reducing the magnitude of fluid pressure in the first chamber in response to the rate of pressure rise of the output fluid of said first pump exceeding a preselected rate of pressure rise.

4,106,293

STIRLING CYCLE MACHINE WITH A CONTROL DEVICE FOR SUPPLYING WORKING MEDIUM

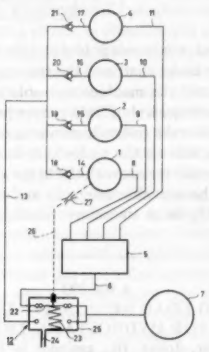
Jacobus Hubertus Abrahams, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 17, 1977, Ser. No. 778,686

Claims priority, application Netherlands, Apr. 2, 1976, 7603430

Int. Cl.[2] F02G *1/06*

U.S. Cl. 60—521 **3 Claims**



1. A hot-gas reciprocating machine with two or more working spaces whose volumes can be varied at a mutual phase difference by piston-like bodies coupled to a crank shaft, a working medium which performs a thermodynamic cycle in each of said working spaces during operation, and a control device comprising a housing having an inlet connected to a source of pressurized working medium and a plurality of outlets, each of which outlets is separately connected to an associated working space, the housing accommodating a control member which, during each revolution of the crank shaft, successively brings each of the outlets separately into open communication with the inlet, each time for a period during which the maximum cycle pressure occurs in the interconnected working space;

wherein the control member is formed by an annular body having a plurality of wall elements distributed over its circumference and arranged to be subject on one side, viewed radially, to the source pressure; and the other side of each wall element is arranged to engage in a sealing manner with an associated outlet where they are subject to the variable cycle pressure occurring in the connected working space, the body further being so arranged that said wall elements close or release the outlets by changes of the shape of this body due to the variable forces acting on this body as a result of the variable differential pressures prevailing across the wall elements.

4,106,294

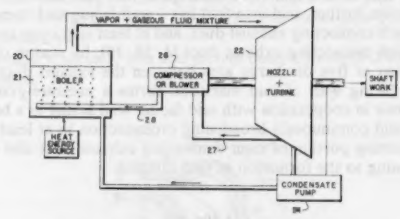
THERMODYNAMIC PROCESS AND LATENT HEAT ENGINE

Julius Czaja, 4 Crestview Dr., Pittsford, N.Y. 14534

Filed Feb. 2, 1977, Ser. No. 765,045

Int. Cl.[2] F02C *1/04*

U.S. Cl. 60—649 **27 Claims**



1. A method of forming a jet of a gaseous fluid for driving a turbine in a heat engine, said method comprising moving a mixture of a vapor and said gaseous fluid through a nozzle so that the expansion of said mixture in said nozzle is sufficient to transform the latent heat of condensation of a substantial portion of said vapor into kinetic energy of said gaseous fluid and cause a substantial portion of said vapor to condense, separating said condensed vapor from said gaseous fluid, and compressing and returning the exhaust from said turbine for reentry to said nozzle.

4,106,295

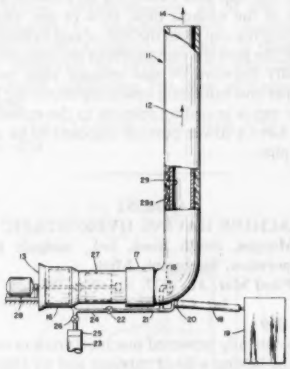
AIR PRESSURE DIFFERENTIAL ENERGY SYSTEM

P. John Wood, 3024 Broadmoor View, Oakland, Calif. 94605

Filed Mar. 14, 1977, Ser. No. 777,342

Int. Cl.[2] F02C *1/04*

U.S. Cl. 60—649 **7 Claims**



1. An energy-generating system comprising:

a stack having open lower and upper ends for receipt and discharge respectively of air at relatively high and low atmospheric pressures;

means heating and humidifying the air within said stack adjacent said lower end inducing an upward flow of air in said stack; and

a turbine mounted in said stack and driven by said air flow.

4,106,296

METHOD OF SOIL STABILIZATION

John B. Leonard, Jr., 119 Bridge Rd., Hillsborough, Calif. 94010, and Laurence Latta, Jr., 1010 Westridge Dr., Portola Valley, Calif. 94025

Continuation-in-part of Ser. No. 599,383, Jul. 28, 1975. This application Jul. 23, 1976, Ser. No. 708,286

Int. Cl.[2] E02D *3/14*

U.S. Cl. 61—36 C 29 Claims

1. A method of stabilizing soil which comprises the steps of applying to the soil an aqueous emulsion comprising water and an epoxy resin ester which is a reaction product of bisphenol A-glycidyl ether type epoxy resin with an unsaturated fatty acid, and wherein the ratio of water to said reaction product is about 1:1 to about 1000:1, in an amount sufficient to wet the soil to a predetermined thickness; compacting the wet soil to a predetermined density; and curing the reaction product wetting the compacted soil at ambient conditions.

4,106,297

METHOD OF AND AN ARRANGEMENT FOR ESTABLISHING AN UNDERGROUND PASSAGE

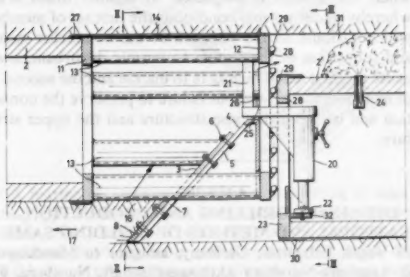
Richard Weiss, Endstrasse 7, 4130 Moers, Fed. Rep. of Germany

Filed Sep. 17, 1976, Ser. No. 725,137

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1975, 2546491

Int. Cl.[2] E21D *9/00*

U.S. Cl. 61—42 7 Claims



1. A method of correcting the course, particulaly the slope, of an elongated underground conduit that includes an original line of consecutive pipe sections of given transverse diemensions embedded in a surrounding material and follows a desired course except for at least one region where the conduit follows a deviating course, the method comprising the steps of aligning a leading end of an additional line of consecutive pipe sections of the given transverse dimensions with one end of the original line; advancing the lines until the leading end of the additional line reaches the one region; removing the surrounding material present between the boundaries of the deviating and desired courses at the one region; and so continuing the advancement of the lines that the additional line follows the desired course even through the one region.

4,106,298

DEVICE FOR THE PRODUCTION OF EARTH HOLES

Hans Mathieu, Bischmisheim, and Jürgen Hochstrasser, Stengelstrasse 6, 66 Saarbrucken 1, both of Fed. Rep. of Germany, assignors to Elizabeth Hochstrasser nee Wack and Jurgen Hochstrasser, both of, Germany

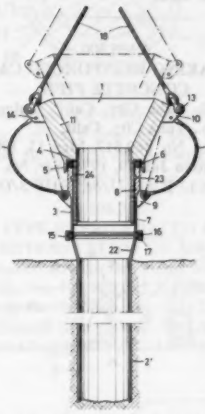
Filed Oct. 26, 1976, Ser. No. 735,589

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1975, 2550595

Int. Cl.[2] E02D *11/00*

U.S. Cl. 61—53.64 17 Claims

1. A device for the production of earth holes and poles, which are located in these holes, which poles are made of poured or compressed concrete, said device comprising a ram equipped with an axial, cylindrical opening, an earth remover insertable in said opening for the concurrent removal of the earth by means of said earth remover; a tube, said ram further comprising a cylindrical extension which is inserted into said tube and serves to guide the ram during its ramming movements, which ram can be lifted and lowered by a crane, and which ram is brought into contact with the frontal plane of the



tube characterized by the fact that the tube is connected in a disconnectable fashion with the ram by means of yielding devices, which determine the lifting height of the ram, a ring-shaped shoulder formed on the ram and having a groove for the reception of a noise-muffling buffer and for the reception of the frontal plane of the tube; said tube having a groove formed on the inner surface thereof, a snap ring in said groove to define a stop; and an axially movable compression-and-impact-piston tightly contained in the tube below the snap ring.

4,106,299

METHOD FOR INSTALLATION OF GROUNDING POLE

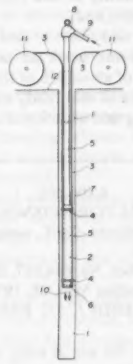
Masami Fujii, 3294-2 Oaza Ota, Hazaki-machi, Kashima-gun, Ibaragi-ken, Japan

Filed Dec. 3, 1976, Ser. No. 747,128

Claims priority, application Japan, Jun. 18, 1976, 51-071723

Int. Cl.[2] E02B *1/00*

U.S. Cl. 61—63 8 Claims



1. A method, for installation of a grounding pole in the earth, which comprises the steps of:

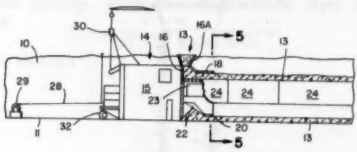
(a) boring a hole in the earth to a desired depth
(b) securing an end of at least one grounding pole, having a length substantially equal to the depth of said hole, to a guide member,
(c) inserting said grounding pole and said guide member fully into the hole with the guide member leading,
(d) measuring contact resistance between the earth and a boring machine during boring operation, and terminating said boring when the contact resistance is not greater than a desired target value.

4,106,300

METHOD OF MAKING REINFORCED CAST-IN-PLACE CONCRETE PIPE

Charles T. McNeill, Yuba City, Calif., assignor to No-Joint Concrete Pipe Co., Yuba City, Calif.

Continuation of Ser. No. 469,517, May 13, 1974, abandoned. This application Jul. 19, 1976, Ser. No. 706,891
Int. Cl.[2] B28B *21/88;* **E03F** *3/06*
U.S. Cl. 61—72.2 **1 Claim**



1. In the method of making cast-in-place concrete pipe, which method includes the steps of:
(a) digging a ditch in the ground having a bottom portion shaped to conform to the part of the pipe to be cast directly in the ground;
(b) moving a mechanism lengthwise in said ditch, which mechanism is adapted to receive and distribute concrete to form said pipe in a continuous manner within said ditch;
(c) loading a quantity of a concrete mix suitable for use in making cast-in-place concrete pipe into a ready-mix truck at a central supply point remote from said mechanism;
(d) transporting and mixing said quantity of concrete mix in transit from said central supply point to said mechanism; and
(e) introducing said quantity of concrete mix into said mechanism for formation of said pipe;
the improvement comprising the additional steps of:
(f) forming a plurality of fibers each having a diameter of about 10 mils and a length between about ¼ and about 2 inches;
(g) transporting a quantity of said fibers to said mechanism for forming said pipe; and
(h) gradually adding said fibers to said quantity of concrete mix in said ready-mix truck at said mechanism in an amount by weight of about 2% of the weight of the quantity of concrete mix in said ready-mix truck immediately prior to introducing said quantity of concrete mix into said mechanism.

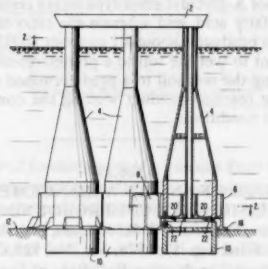
4,106,301

BUILDING SYSTEM FOR SEISMIC-ACTIVE AREAS

Ben C. Gerwick, Jr., Oakland, Calif., assignor to Kajima Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 644,017, Dec. 24, 1975, Pat. No. 4,045,968. This application Mar. 28, 1977, Ser. No. 782,258
Int. Cl.[2] E02B *17/00;* **E02D** *5/00*
U.S. Cl. 61—86 **14 Claims**

1. A building system for use in areas susceptible to seismic disturbances, comprising,
a base structure,
an upper structure connected to the base structure and being laterally movable with respect to the base structure when subjected to seismic disturbances,
connector means extending between and interconnecting the base structure and the upper structure, said connector means including a first set of members extending between said base structure and said upper structure and a second set of members extending between said base structure and said upper structure,
said first set of members being relatively rigid and capable of failure by buckling, when the system is subjected to seismic disturbances,



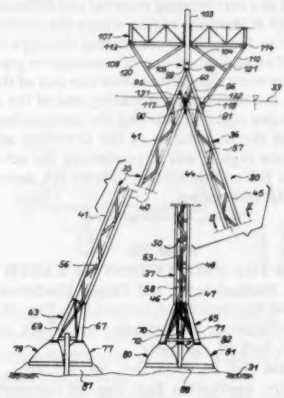
said second set of members being more flexible than said first set of members and capable of flexing without failing when the system is subjected to seismic disturbances whereby under normal conditions the first set of members will contribute to the strength of the connector means, and subjection of the system to seismic disturbances will cause the first set of members to buckle and the second set of members to flex without failure to preserve the connection and between the base structure and the upper structure.

4,106,302

OFF-SHORE DRILLING AND PRODUCTION PLATFORM AND METHOD OF BUILDING SAME

Rudolf Vogel, Salzgitter, Germany, assignor to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Nurnberg, Fed. Rep. of Germany

Filed May 17, 1976, Ser. No. 686,685
Int. Cl.[2] E02B *17/00*
U.S. Cl. 61—94 **41 Claims**



1. An off-shore drilling and production platform in combination which includes a working deck for location above the water level of the sea in which the platform is to be installed,

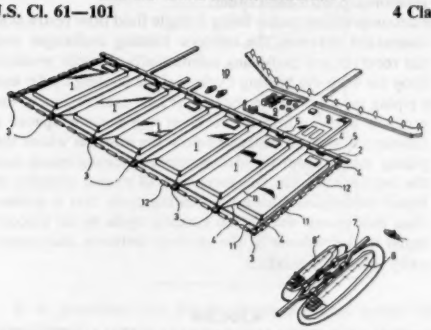
legs supporting said deck and diverging from said deck in downward direction for resting on the bed of the sea in which the said platform is to be installed, said legs comprising hollow sections and being interconnected in the region of their upper ends only, each leg being formed as a three-post space framework with tubular posts, each post being formed with an axially continuous hollow space with the wall of the hollow space being gastight, the hollow space of each post is being connectible with a pressure gas pipe, each post having a pipe therewith for a ballast liquid extending from the top of the post down to the hollow space of its spud tank, each leg carrying at its top part of a universal joint which cooperates with the other joint parts, at least one grouping of the joint parts and the joint members being welded together.

4,106,303

MARINE OIL STORAGE INSTALLATION

Hiroyuki Shimada, Nagasaki, and Shozo Toyoda, Yokohama, both of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 1, 1977, Ser. No. 802,317
Claims priority, application Japan, Jun. 10, 1976, 51-68013
Int. Cl.[2] B63B *25/08;* **E02B** *3/04*
U.S. Cl. 61—101 **4 Claims**



1. A marine oil storage installation comprising at least one floating type oil storage tank provided with shore connection means to effect transfer of oil to and from said tank, each said storage tank having double walled side walls and a double walled bottom, protector means composed of at least one line of floating members surrounding each oil storage tank respectively for protecting each oil storage tank from damage as the result of waves and contacting moving objects and for preventing oil from flowing out of said installation, mooring means for drawing each oil storage tank, loading arm means carried on said mooring means being adapted for connection and disconnection with said shore connection means of each said oil storage tank respectively, a shore based facility installed on the shore or on an artificial land and communicating with said loading arm means on said mooring means, and a platform installed on the sea for moorage of tankers and provided with means communicating with said shore based facility for feeding oil between said tankers and said shore based facility.

4,106,304

THERMODYNAMIC COMPRESSOR

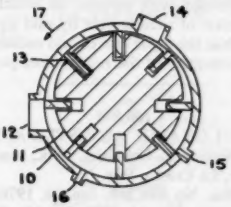
Michael Eskeli, 7994-41 Locke Lee, Houston, Tex. 77042

Continuation-in-part of Ser. No. 708,863, Jul. 26, 1976, Ser. No. 546,912, Feb. 4, 1976, abandoned, and Ser. No. 600,312, Jul. 30, 1975, Pat. No. 3,986,361. This application Sep. 17, 1976, Ser. No. 724,407
Int. Cl.[2] F25B *3/00*
U.S. Cl. 62—88 **4 Claims**

1. A method of compressing a compressible working fluid comprising:

a. confining said working fluid in an approximately constant volume and simultaneously adding heat into said working fluid increasing the temperature of said working fluid, and increasing the pressure of said working fluid;

b. elevating the pressure of said working fluid by adding work into subsequently said working fluid in a mechanical compressing means;



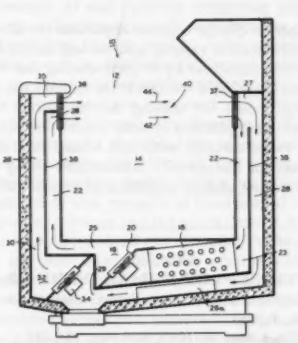
c. removing heat from said working fluid and transferring at least a portion of such heat into said working fluid upstream of said mechanical compressing means.

4,106,305

OPEN WELL TYPE REFRIGERATED DISPLAY CASE WITH REVERSE FLOW OF AIR BANDS

Fayez F. Ibrahim, 830 Skyline Dr., Niles, Mich. 49120

Continuation of Ser. No. 703,225, Jul. 7, 1976, abandoned, which is a continuation of Ser. No. 564,256, Apr. 2, 1975, abandoned. This application May 4, 1977, Ser. No. 793,592
Int. Cl.[2] F25D *17/06;* **A47F** *3/04*
U.S. Cl. 62—89 **12 Claims**



11. A method for cooling an open well refrigerated product display case having a bottom portion, upstanding front, rear, and side portions, and an open top which defines an access opening to a display space in the refrigerated case, the method comprising:

providing an inner air passage adjacent to and substantially surrounding the bottom and sides of said display space, and providing cooling means mounted in said inner air passage;

providing a separate outer air passage outwardly of and adjacent to said inner air passage, said outer air passage being in heat exchanging relation with said inner air passage whereby said cooling means also partially cools the air in said outer passage;

each of said inner and outer passages having front and rear end portions, with said front end portion terminating adjacent a front edge of said access opening and said rear end portion terminating at a rear edge of said access opening;

directing a cooled flow of air from said inner air passage through one end portion thereof, across the access opening and into the other end portion thereof to form a first curtain of cooled air;

directing a flow of partially cooled air from the outer air passage substantially horizontally, across the access open-

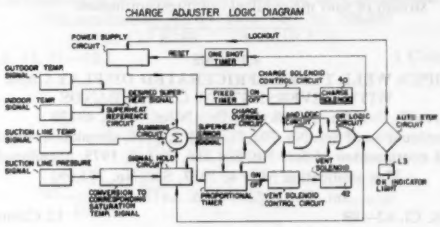
ing to form a second partially cooled curtain of air over said first curtain of air thereof, with the use of said cooled inner air curtain and said partially cooled outer air curtain permitting the use of high velocity air curtains without excessive aspiration with ambient air which in turn permits the removal of radiant heat by said air curtains at a rate greater than the input rate of said radiant heat to thus maintain the integrity of the refrigerated product.

4,106,306

REFRIGERANT CHARGE ADJUSTER APPARATUS

James Fredrick Saunders, Onalaska, Wis., assignor to The Trane Company, La Crosse, Wis.

Continuation of Ser. No. 699,369, Jun. 24, 1976, abandoned.
This application Jun. 24, 1977, Ser. No. 809,592
Int. Cl.[2] F25B *45/00*
U.S. Cl. 62—149 **8 Claims**



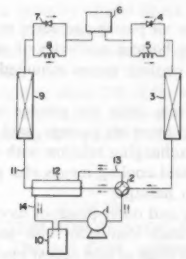
1. In a refrigerant charge adjuster apparatus for adjusting the charge in a refrigeration system, and having means for determining the actual superheat by at least sensing the refrigerant saturation pressure of said refrigeration system, the improvement including: means for sensing the refrigerant saturation pressure of said refrigeration system, means for producing a signal which varies directly with said sensed saturation pressure, and means for temporarily substantially fixing the value of said signal during charge adjustments in said refrigeration system.

4,106,307

REVERSE-FLOW AIR CONDITIONER

Toshiharu Matsuda, Kudamatsu, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 4, 1977, Ser. No. 774,487
Claims priority, application Japan, Mar. 5, 1976, 51-23270; May 12, 1976, 51-26136
Int. Cl.[2] F25B *13/00, 43/00*
U.S. Cl. 62—324 **9 Claims**



1. A reverse-flow air conditioner for a selective operation on a heating cycle or a cooling cycle, comprising a compressor for delivering a hot compressed refrigerant gas, an indoor heat exchanger to act as the evaporator during the cooling cycle and as the condenser during the heating cycle, an outdoor heat exchanger to act as the evaporator during the heating cycle and the condenser during the cooling cycle, piping means interconnecting the compressor, outdoor heat exchanger, and indoor heat exchanger, a four-way valve for selectively connecting the compressor outlet to the indoor heat exchanger during the heating cycle and the outdoor heat exchanger during the cooling cycle, a receiver connected between the indoor heat exchanger and the outdoor heat exchanger in the piping means, decompression means in the piping means between the indoor heat exchanger and the outdoor heat exchanger for reducing the pressure of the liquid refrigerant condensed in and flowing from the indoor heat exchanger during the heating cycle and the outdoor heat exchanger during the cooling cycle to produce a mixture of gas

and liquid refrigerant at reduced pressure and temperature, and a suction accumulator in the piping means between the suction inlet of the compressor and the four-way valve for separating refrigerant into gas and liquid portions, with the four-way valve feeding the refrigerant from the outdoor heat exchanger to the suction accumulator during the heating cycle and from the indoor heating exchanger to the suction accumulator during the cooling cycle, wherein the improvement comprises in combination:

the suction accumulator and receiver being in heat exchange relationship with each other;

the decompression means being a single fluid flow restriction connected between the outdoor heating exchanger and the receiver and providing substantially the sole pressure drop for both the heating cycle and the cooling cycle; and

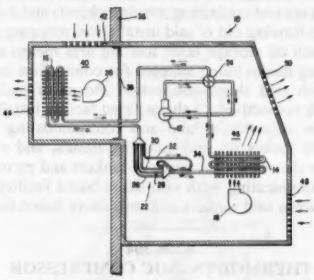
the piping means between the indoor heat exchanger and the receiver opening into the receiver at a position spaced a substantial vertical distance below the position where the piping means from the decompression means opens into the receiver, so that the receiver will store a quantity of liquid refrigerant during the heating cycle that is greater than that stored during the cooling cycle by an amount equal to the volume of the receiver between such vertically spaced openings.

4,106,308

HEATING AND COOLING SYSTEM WITH CAPILLARY CONTROL MEANS

Jerome Freed Miller, Auburn, N.Y., assignor to The Singer Company, New York, N.Y.

Filed May 19, 1977, Ser. No. 798,529
Int. Cl.[2] F25B *13/00, 39/02, 41/06*
U.S. Cl. 62—324 **1 Claim**



1. In a reversible air conditioning system, means for compressing a refrigerant to be circulated through the system, a roomside heat exchanger, another heat exchanger exposed to outside air, a capillary system for metering the flow of refrigerant between the two heat exchangers, and a reversing valve for reversing the direction of flow of refrigerant through the two heat exchangers and capillary system, the capillary system including a plurality of branch lines all of which are out of heat exchanging relationship with both of said heat exchangers, and at least one of the said branch lines including a looped portion in a heat exchanging contacting relationship with a refrigerant

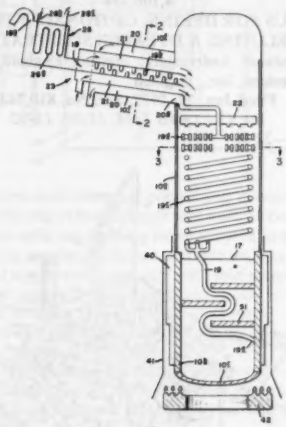
carrying line between the capillary system and the roomside heat exchanger.

4,106,309

ANALYZER AND RECTIFIER METHOD AND APPARATUS FOR ABSORPTION HEAT PUMP

Benjamin A. Phillips, Benton Harbor, Mich., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed May 13, 1977, Ser. No. 796,631
Int. Cl.[2] F25B *15/00, 33/00*
U.S. Cl. 62—476 **14 Claims**



1. A generator unit for an absorption heat pump system comprising:

a. a housing defining an upstanding interior zone including a zone boiler being a reservoir zone for a rich liquor solution of absorbent and refrigerant and an analyzer zone above the boiler zone, and also defining a rectifier zone slanting upwardly and outwardly from adjacent said interior zone above said analyzer zone; said rectifier zone being divided into three conduits, a first conduit being a weak liquor outlet conduit, a second conduit being a rich liquor inlet conduit and a third conduit being a refrigerant outlet conduit with said second conduit being in heat exchange relation with said first and third conduits;

b. a fourth conduit being a weak liquor conduit extending from said boiler zone to an end of said first conduit proximal said interior zone, the interior of said fourth conduit being out of communication with and in heat exchange relation with said analyzer zone, and said second and third conduits communicating with said interior zone whereby rich liquor and refrigerant vapor in said analyzer zone are in heat and mass exchange relation with each other and in heat exchange relation with weak liquor in said fourth conduit;

c. boiler means in said boiler zone for evaporating refrigerant into said interior zone from rich liquor containing refrigerant in said boiler zone and for propelling weak liquor depleted of refrigerant into the lower end of said fourth conduit and through said fourth conduit and first conduit; and

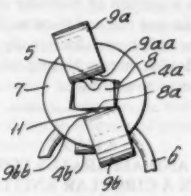
d. reflux means in said third conduit adjacent an end of said rectifier zone distal said interior zone for withdrawing heat from refrigerant vapor and condensing absorbent vapor, said third conduit being slanted to permit condensed absorbent to flow in a downward path into said interior zone.

4,106,310

PIERCED EARRING DEVICE

Herbert Abramowitz, 143-19 25th Ave., Whitestone, N.Y. 11357

Filed Jun. 20, 1977, Ser. No. 808,154
Int. Cl.[2] A44C *7/00*
U.S. Cl. 63—12 **4 Claims**



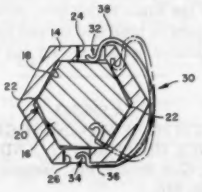
1. An earring device comprising in combination: an elongated post having at-least one side thereof extending as a planar surface along an axis transversely of a longitudinal axis of the elongated post, further having ornament-attaching means at one end thereof for the supporting of an ornament thereon, and an opposite remaining end of the elongated post being of a shape adapted to be fastened to an anchoring element, adapted such that when mounted in a pierced ear said one side's planar surface faces downwardly thereby providing optimally maximum surface area, and earring post-locking means for detachable securement to said opposite remaining end, comprising said anchoring element, adapted for preventing withdrawal of the elongated post from a pierced earlobe when the earring post-locking means is attached, said earring postlocking means including receptacle structure forming and providing a space receivable of said opposite remaining end therein and space-defining walls of said space being shaped such that a cross-section of the space is of a shape and size substantially the same as a cross-section transversely through said elongated post, and the earring post-locking means further including a clamping means attached to and mounted in fixed spacial relationship to said receptacle structure and the space thereof, and the clamping means including at-least one clamping surface extending in a manner and positioned such that, when in a clamping state, the clamping surface presses against said one side's planar surface in a non-parallel relationship thereto whereby a slight twist is imparted to said post relative to said earring post-locking means such that the anchoring thereof is improved against potential accidental unfastening.

4,106,311

NO-LASH AXIALLY MOVABLE STEERING COLUMN

Richard W. Euler, La Porte, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Dec. 13, 1976, Ser. No. 750,295
Int. Cl.[2] F16D *3/06;* **B62D** *1/18*
U.S. Cl. 64—23 **6 Claims**



1. A variable length column assembly comprising:

a tube having an outer circumferential surface and an internal polygonal bore therein;

a shaft having a polygonal surface and extending into said

tube polygonal bore, said shaft cooperating with said tube to provide for limited rotation therebetween; and

flexible means frictionally engaging said tube and said shaft to resiliently oppose the rotation therebetween and permitting axial movement between said tube and said shaft when the axial forces therebetween offset the frictional engagement therebetween, said flexible means extending over at least a portion of said tube outer circumferential surface and having one end frictionally engaged with said tube and the other end frictionally engaged with said shaft, said flexible means biasing said shaft to a rotated position relative to said tube.

4,106,312

METHOD AND APPARATUS FOR SELECTING NEEDLES IN A CIRCULAR KNITTING MACHINE

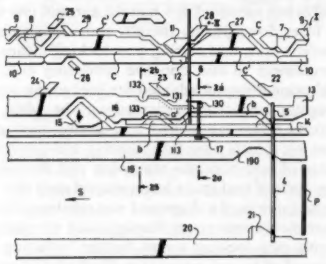
Josef Maleř; Evžen Fischer; Miloslav Losert, and Miroslav Kopečný, all of Trebic, Czechoslovakia, assignors to Elitex, Koncern textilniho strojirenstvi, Liberec, Czechoslovakia

Filed Feb. 15, 1977, Ser. No. 768,863

Claims priority, application Czechoslovakia, Feb. 20, 1976, 1114/76

Int. Cl.² D04B *15/68*

U.S. Cl. 66—50 R **2 Claims**



1. The method of controlling the operation of the needles in a circular knitting machine having two yarn feed systems, a cam system and a needle selection system for each needle including at least a needle jack, a selector jack and an intermediate jack located therebetween, cooperating with said cam system to reciprocate the associated needle, comprising the steps of arranging before the stitch knock-over point of one of said feed systems, pattern selection means for rocking certain ones of said selector jacks into engagement with said cam system and a lifting cam arranged after the knock-over point of said one feed system to raise said certain ones of said selector jacks into engagement with said intermediate jack, to engage the needle jack to actuate the associated needles in the other of the feed systems, and arranging prior to the stitch knock-over point of the other of the feed systems a tilting cam to rock the intermediate jacks associated with the selector jacks not rocked by the patterning means into engagement with the cam system and after the stitch knock-over point of the other feed system a lifting cam to raise said rocked intermediate jacks to activate the associated needles in said one feed system.

4,106,313

SHEER STRETCH HOSE HAVING HIGH COMPRESSIVE FORCE UNIFORMITY, AND YARN

Norman W. Boe, Gulf Breeze, Fla., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 773,716, Nov. 6, 1968, abandoned. This application Apr. 1, 1971, Ser. No. 130,351

Int. Cl.² D04B *7/18*

U.S. Cl. 66—202 **18 Claims**

1. A garment having a leg portion knitted from a helically crimped yarn, said yarn comprising two side-by-side substantially permanently conjugated components, one of said components being translucent and substantially undyed and the other of said components being dyed.

4,106,314

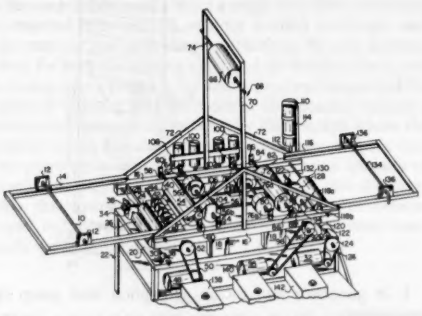
APPARATUS FOR DYEING, OPTIONALLY FIXING AND ELUTING A DYEABLE SUBSTRATE

Gabriel Rostanol Andrianjafy, Hatton, England, assignor to B.S.G. Designs, Inc., England

Filed Jun. 28, 1977, Ser. No. 810,742

Int. Cl.² D06B *1/14, 11/00, 15/02*

U.S. Cl. 68—22 R **8 Claims**



1. An apparatus for dyeing, optionally fixing and eluting a dyeable substrate, said apparatus comprising:

a take-up roller for receiving the dyeable substrate;

roller means, including a driven roller, for receiving said substrate from said take-up roller and for orienting said substrate in a generally horizontal plane;

a dyeing assembly including a plurality of dye containers, a like plurality of discs mounted on a first rotatable shaft so that, for each disc, one edge thereof dips into the container so as to pick up dye therefrom, the opposite edge of each of said discs engaging the substrate;

an idler roller assembly for receiving the substrate after the substrate passes through the dyeing assembly;

a further roller, mounted a substantial distance above the working plane of said apparatus, over which said substrate is entrained;

a further idler roller assembly, for receiving said substrate after said substrate passes over said further roller;

an eluting assembly including a plurality of eluant containers, a like plurality of discs mounted on a second rotatable shaft so that, for each disc, one edge dips into the container so as to pick up eluant therefrom, the opposite edge of each of said discs engaging the substrate;

pinch roller means, including a driven roller, for receiving said substrate from said eluting assembly and pinching said substrate therebetween;

a take-off roller for receiving said substrate from said pinch roller means;

means including a plurality of dye storage tanks mounted on said apparatus for selectively gravity feeding dye to said dye containers;

means, including an eluant storage tank mounted on said apparatus, for feeding eluant to said eluant containers; and

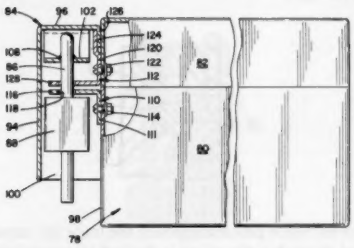
first and second separate drive motor means for selectively driving said first and second shafts at variable speeds.

4,106,315

SHIELDED LOCK ASSEMBLY

John A. Dohanyos, 2711 Vestry Ave., Cleveland, Ohio 44113

Filed Jan. 14, 1977, Ser. No. 759,576
Int. Cl.[2] E05B *67/38*
U.S. Cl. 70—56 **6 Claims**



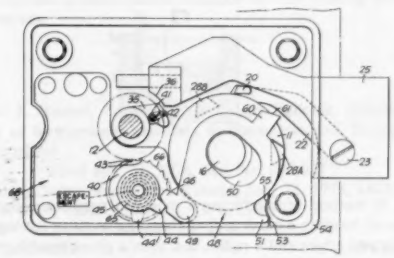
1. A shielded lock assembly comprising in combination:
a housing having at least a single side wall, an outer wall, and an upper wall, said housing being adapted to be positioned adjacent a member such that said side wall, said outer wall and said upper wall cooperate with said member to define a closed generally cup-shaped enclosure with an access opening near the bottom of said enclosure;
at least one locking staple extending from said member into said enclosure;
a shackle and lock body disposed within said enclosure;
a shackle hanger supported interiorly of said enclosure, said shackle being held and retained within said enclosure by said hanger;
said locking staple engaging said shackle in a locked position;
retention means to secure the upper portion of said housing in engagement with said member in a manner so as to render more difficult the removal of said housing away from said member.

4,106,316

KEYLESS COMBINATION LOCKS

Arthur D. Tippin, Tamworth, England, assignor to Chubb & Son's Lock and Safe Company Limited, London, England

Filed Feb. 25, 1977, Ser. No. 772,025
Claims priority, application United Kingdom, Mar. 11, 1976, 9844/76
Int. Cl.[2] E05B *43/00, 37/08*
U.S. Cl. 70—268 **10 Claims**



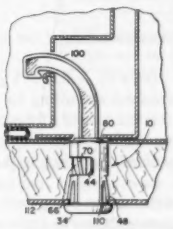
1. In a combination lock comprising a bolt, a dial, a plurality of co-operating co-axial combination wheels, means for driving said combination wheels from said dial, and means co-operating with said combination wheels for connecting said dial to said bolt when the correct combination has been dialled for operating said lock, the improvement comprising a rotary member rotatable between a datum position and a second position, means turned by rotation of said dial for driving said rotary member from said datum position to said second position responsive to the excessive rotation of said dial characterizing unauthorized operation, a protective member movable between an inoperative position and an operative position for rendering operation of the lock impossible, said protective member being engaged by said rotary member for being placed in said inoperative position when said rotary member is in said datum position and being moved to said operative position when said rotary member is in said second position and means for returning said rotary member to said datum position thereof after a time delay to return said protective member to said inoperative position.

4,106,317

FREEZER LOCK ASSEMBLY WITH KEY EJECTING MECHANISM

Bruce W. Anderson, Arlington Heights, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Jun. 6, 1977, Ser. No. 803,095
Int. Cl.[2] E05B *17/00*
U.S. Cl. 70—388 **20 Claims**



1. A lock having a low co-efficient of thermal conductivity adapted to be mounted in an apertured workpiece including a first body means having a bore therethrough and plug means rotatably mounted within said bore and having integral driver means adapted to directly and slidingly receive a key, resiliently urged key ejector means surrounding and coupled to said plug driver means and axially and rotationally moveable within said bore, and mutually engageable locking means carried by said ejector means and said body means for restraining rotation of said plug at predetermined angular locations.

4,106,318

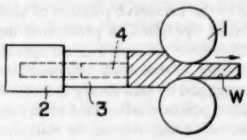
METHOD AND APPARATUS FOR ROLLING METALLIC MATERIAL

Samon Yanagimoto; Minoru Kawaharada; Shuji Nagata, and Fujimasa Koyama, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Kitakyushu, Japan

Continuation of Ser. No. 564,894, Apr. 30, 1975, abandoned. This application Jan. 17, 1977, Ser. No. 759,868
Claims priority, application Japan, Dec. 17, 1974, 49-145316; May 15, 1974, 49-54027; May 15, 1974, 49-54028
Int. Cl.[2] B21B *1/00, 1/08, 1/02, 39/06*
U.S. Cl. 72—199 **11 Claims**

1. A method of rolling a steel workpiece by using a rolling mill having opposed working rolls in a fixed position relative to the direction of travel of the workpiece and at a fixed spacing from each other, which method comprises rolling the workpiece between the working rolls while driving said rolls and continuously exerting on the workpiece a force in the direction of movement of the workpiece through the rolling mill in addition to the force exerted in the direction of rolling by the working rolls within the surface of contact of the working rolls and the workpiece and which additional force in the

direction of movement of the workpiece is less than that necessary to stress the workpiece beyond its yield point under the conditions of rolling and having a value $\sigma_p \times A$ where A is the



cross-sectional area of the workpiece and σ_p is the additional exerted force per unit area of the workpiece and is represented by:

$$1 > \frac{\sigma_p}{K} \geqq \frac{1}{a\mu}(\theta - C_1) - \frac{b}{a} > 0$$

where:

K: Yield stress (kg/mm^2) of the workpiece at the rolling temperature

θ: Contact angle of the working roll (rad)

a: Constant

b: Constant

C_1: Constant

μ: Coefficient of friction between the working roll and the workpiece

$\mu = [C_2(1.05 - 0.0005.T) - 0.056 \cdot V_R] C_3$

C_2: Constant determined according to the material of the working roll; 1.0 in the case of a forged steel roll; 0.8 in the case of a cast steel roll

C_3: Constant determined according to the roll lubrication = $1 \sim 0.1$

V_R: Rolling speed (m/sec)

T: Rolling temperature (°C)

whereby an elongation of the workpiece is produced which is much greater than the arithmetic sum of the elongation which would be produced by the driven working rolls alone and the elongation produced by the force in the direction of movement of the workpiece alone for moving the workpiece through non-driven rolls.

4,106,319

APPARATUS FOR HOT-ROLLING NON-FERROUS METALS

Robert Steven Linne, Carrollton, Ga., assignor to Southwire Company, Carrollton, Ga.

Filed Mar. 11, 1977, Ser. No. 776,796

Int. Cl.^{2} B21B *1/00*

U.S. Cl. 72—234 **8 Claims**

1. A hot-rolling mill for hot-working of non-ferrous metals including a plurality of successively arranged roll stages comprising a breakdown roll stage, an intermediate roll stage and a finishing roll stage, the work rolls of said finishing stage having a greater hardness than the work rolls of either of said intermediate roll stage and said breakdown roll stage and the work rolls of said intermediate stage having a greater hardness than the work rolls of said breakdown stage.

4,106,320

FORMING OF MATERIALS BY EXTRUSION

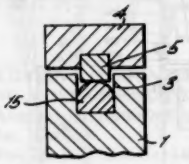
John Alan Pardoe, Lytham Saint Annes; Clifford Etherington, Blackpool, and Eric Hunter, Preston, all of England, assignors to United Kingdom Atomic Energy Authority, London, England

Continuation of Ser. No. 570,782, Apr. 23, 1975, abandoned. This application May 11, 1976, Ser. No. 685,186

Claims priority, application United Kingdom, May 7, 1974, 20119/74; Dec. 11, 1974, 53645/74

Int. Cl.^{2} B21C *23/21, 23/32*

U.S. Cl. 72—256 **8 Claims**



1. In an extrusion process in which the force for extrusion of a material through a die means is derived by maintaining frictional engagement of the said material with passageway-defining surfaces of a member which is moved toward the die means, relative to a non-moving part of the passageway surface, such that frictional drag of the moving passageway-defining surfaces urges the said material through the die means, the improvement, for enhancing the force available for extrusion, wherein the cross-sectional configuration of said material in said passageway over an initial lengthwise portion thereof is such that over said initial lengthwise portion said material makes generally lengthwise line contact with said non-moving part and substantially greater than lengthwise line contact with one of the passageway-defining surfaces of said moving member.

4,106,321

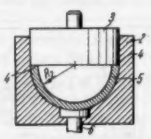
METHOD OF PRODUCING MOULDED PARTS

Mikhail Alexandrovich Platonov, Profsojuznaya ulitsa, 96, kv. 100, and Grigory Vasilievich Pokrovsky, 9 ulitsa Sokolinoi gory 1, kv. 15, both of Moscow, U.S.S.R.

Continuation of Ser. No. 584,170, Jun. 5, 1975, abandoned, which is a continuation of Ser. No. 497,735, Aug. 15, 1974, abandoned, which is a continuation of Ser. No. 396,221, Sep. 11, 1973, abandoned. This application Apr. 30, 1976, Ser. No. 682,104

Int. Cl.^{2} B21D *22/00*

U.S. Cl. 72—348 **1 Claim**



1. A method of producing a moulded part comprising the steps of: bending a blank to form bending sections having open upper end edges and a radius less than a given bending radius of a part to be produced; placing the bent blank completely in a die; and exerting pressure only on the open upper end edges of the blank along the generant of the bending sections with a resultant gradual increase of the bending radius to the given bending radius.

4,106,322

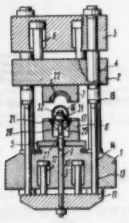
PRESS FOR PRESSING PIPE FITTINGS

Evgeny Nikolaevich Moshnin, ulitsa Akademika Pavlova, 50, kv. 5; Alexei Fedorovich Nistratov, ulitsa Khlobystova, 16, korpus 1, kv. 48; Viktor Alexeevich Odnodushny, Stremyanny pereulok, 2/12, kv. 8; Nikolai Ivanovich Romashko, Sumskoi proezd, 12, korpus 4, kv. 108, and Nikolai Pavlovich Schlyakhin, Stremyanny pereulok, 17/12, kv. 43, all of Moscow, U.S.S.R.

Filed Sep. 22, 1976, Ser. No. 725,506

Int. Cl.[2] B21D *22/00*

U.S. Cl. 72—356 **7 Claims**



1. A press for pressing pipe fittings from tubular billets comprising: a stationary crosshead; a sliding table mounted on said stationary crosshead; a lower die mounted on said sliding table, a vertical passage along the press axis and extending through said stationary crosshead, said sliding table and said lower die; a movable crosshead located above said stationary crosshead and carrying an upper die; a third crosshead, connecting means for interconnecting said stationary crosshead, said movable crosshead, and said third crosshead comprising pillars; a drive means associated with said third crosshead for reciprocating said movable crosshead whereby said upper die is moved into engagement with said lower die; a pulling device means for pulling a punch along the press axis and through a tubular billet comprising a rod carried within said vertical axial passage of said stationary crosshead, an auxiliary crosshead positioned below said stationary crosshead, means for connecting said rod to said auxiliary crosshead, pulling device drive means associated with said stationary crosshead and connected to said auxiliary crosshead for driving said auxiliary crosshead with respect to said stationary crosshead thus moving said rod within said vertical axial passage, said auxiliary crosshead further comprising a pair of vertical spindles with stops mounted at the ends of the vertical spindles for contacting said movable crosshead at the beginning of radial compression of the tubular billet by said upper and lower die, wherein said rod is axially movable a first predetermined distance by means of said movable crosshead contacting said stops mounted at the ends of said vertical spindles and moving said vertical spindles until said upper die carried on said movable crosshead contacts said lower die mounted on said sliding table, and axially movable a second predetermined distance by said pulling device drive means.

4,106,323

BENDING TOOL

Eduard J. Haenni, Zofingen, and Vaclav Zbornik, Oftringen, both of Switzerland, assignors to Haennerle AG, Zofingen, Switzerland

Filed Jun. 21, 1976, Ser. No. 698,007

Claims priority, application Austria, Jun. 24, 1975, 4849/75; Oct. 13, 1975, 7808/75; Apr. 2, 1976, 2404/76

Int. Cl.[2] B21D *7/06*

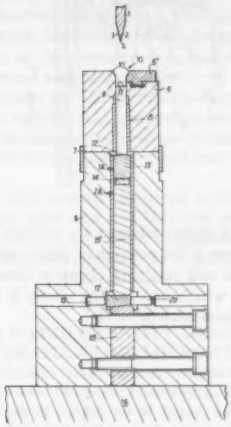
U.S. Cl. 72—389 **5 Claims**

1. A bending device adapted to be connected to a bending press for the bending of sheet metal in said press, comprising in combination:

a male bending die adapted to be connected to the ram of the bending press with a tapered end, and a female bending die resting on a die support, said female die having a longitudinal groove on its top side facing said male die and cooperating with said tapered end of said male die;

said longitudinal groove determining by its width and depth the bending angle to be achieved in the sheet metal workpiece fitted between said male die and female die whereby at least one of the limiting planes of the groove is displaceable in its position relative to the other limiting planes of the groove to change the shape of the groove and thereby the angle to be bent in the sheet metal;

a displaceable jaw on said female die to change the width of



said groove, said jaw having a first guide means protruding from said displaceable jaw and engaging a first guide notch in the base part of said female die, said first guide means and said first guide notch extending in an angle to said groove, the width of said groove thereby changing by sliding said first guide means along said first guide notch, and

a displaceable support means to change the depth of said groove, said support means resting on a second guide means arranged in a second guide notch in said die support of said female die, a displacement of said second guide means varying the depth of said groove.

4,106,324

FEEDING MECHANISM

Martin Götz, Sersheim, Germany, assignor to Erich Grau Stanzwerk fur Elektrobleche, Sersheim, Germany

Filed Nov. 10, 1975, Ser. No. 630,417

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1974, 2454460

Int. Cl.[2] B21D *43/02;* **B26D** *5/20;* **B65H** *17/36*

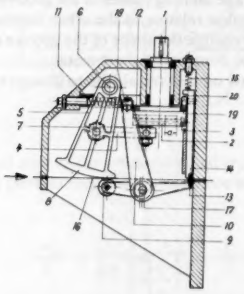
U.S. Cl. 72—421 **9 Claims**

1. The combination with a processing machine having an eccentric shaft, of

a feeding mechanism for intermittently feeding stock to said machine, which feeding mechanism comprises a rocker lever having at its outer end an arcuate surface shaped according to an arc of a circle, a crank drive driven by the processing machine comprising a crank which is operatively connected to said rocker lever to impart oscillation thereto, a camwheel operatively connected to said crank, a clamping roller adapted to cooperate with said arcuate surface and forming a feeding clamp therewith, a retaining clamp for holding stock in position,

a double bell-crank lever having a first, second and third arm, said first arm carrying said clamping roller, said third arm forming part of said retaining clamp, and said second

arm connecting said first arm and said third arm and positioned for operative connection to said camwheel, a control means including said bell-crank lever, said camwheel and spring means for operatively urging said second arm of said bell-crank lever against said camwheel,



said control means adapted to oscillate said bell-crank lever between a first position in which said feeding clamp is open and said retaining clamp is closed, to a second position in which said feeding clamp is closed and said retaining claim is open.

4,106,325

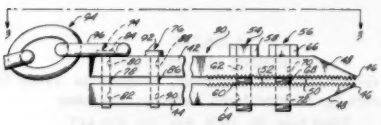
CHISEL CLAMP FOR USE IN STRAIGHTENING AUTOMOBILE BODIES

Charles J. Kuhn, 10520 Plainview Ave., Tujunga, Calif. 91042

Filed May 27, 1976, Ser. No. 690,404

Int. Cl.[2] B21D *1/12*

U.S. Cl. 72—457 **15 Claims**



1. A chisel clamp for use in the application of force when straightening an automobile body member, the clamp comprising a pair of elongated jaws each having a blade edge at one end, and an elongated serrated clamping surface extending inboard from the blade edge; fastening means for releasably extending through the serrated portions of the jaws and for being loosened or tightened so the serrated clamping surfaces of the jaws can apply a controllable amount of pressure to the opposite sides of a workpiece sandwiched between the jaws; alignment means for extending through a portion of the jaws on a side of the fastening means opposite the blade edges for holding the jaws in an overlying relation so the clamping surfaces thereof face one another and for aligning the jaws with one another to facilitate extending the fastening means through the jaws; and flexible chain means rigidly affixed to at least one of the jaws adjacent an end thereof opposite the blade edge for use in cooperating with the jaws to apply force to an automobile body member via the attachment to the workpiece.

4,106,326

INITIALIZATION AND PREPARATION OF ON-PRODUCTION-LINE ULTRASONIC TEST EQUIPMENT

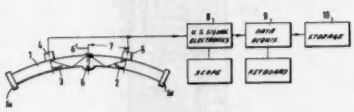
Dieter Lather, Rheurdt, and Karl Ries, Mulheim, both of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Mar. 29, 1977, Ser. No. 782,451

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1976, 2613799

Int. Cl.[2] G01N *29/04*

U.S. Cl. 73—1 DV **4 Claims**



1. Method of initializing and preparing an ultrasonic test stand in a production line for on-line testing of production objects in and passing through the line, comprising the steps of:

providing a dummy, representing a zone of a production object to be traversed by ultrasonic radiation dummy testing;

orienting and positioning an individual test head with reference to said dummy in particular relation to the zone;

conducting first ultrasonic tests by means of the test heads as oriented and positioned under utilization of test circuitry, the tests including (i) generating and launching a test pulse into the dummy, (ii) detecting a particular return echo, (iii) determining an amplitude of the return echo, and (iv) adjusting the timing of a particular gating period on the basis of the detected occurrence of the said return echo;

replacing the dummy by a standard for each test head;

conducting second ultrasonic tests by means of the test heads and the standard and under utilization of the same test circuitry as in the first tests, the second tests including (i) generating and launching a test pulse into the standard; (ii) detecting a particular return echo; (iii) determining an amplitude of the latter return echo; and (iv) determining the transit time of the latter return echo;

arithmetically relating and referencing (i) the amplitudes as acquired pursuant to said first and second tests as conducted and separately for each test head, to obtain amplitude calibration signals; and (ii) arithmetically relating the adjusted timing of the gating period as per the first tests and the transit times of the return echos as per the second tests to obtain timing calibration signals, also separately for each test head;

storing the amplitude and timing calibration signals;

placing the test heads in positions in said test stand being the same or corresponding positions the test heads had in relation to said dummy during the first mentioned conducting test;

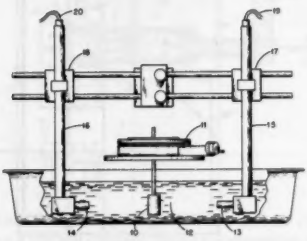
repeating the second ultrasonic tests conducting step with the test head in test stand position but with said standard in position as in said second conducting step and under utilization of a different test circuit to obtain again an amplitude and a transit time for a return echo; and

using the amplitude and transit time data as acquired pursuant to the last mentioned, repeated conducting step and the stored amplitude and timing calibration signals, for adjusting the said test circuit to obtain therein a particular gating period and amplitude response for the subsequent on line testing.

4,106,327
ANISOTROPIC DETERMINATION AND CORRECTION FOR ULTRASONIC FLAW DETECTION BY SPECTRAL ANALYSIS

Laszlo Adler, Knoxville; K. Von Cook, Clinton; William A. Simpson, Jr., and D. Kent Lewis, both of Knoxville, all of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 22, 1977, Ser. No. 853,947
Int. Cl.² G01N *29/00*
U.S. Cl. 73—1 DV **10 Claims**

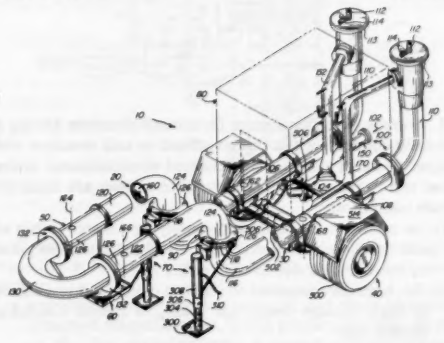


1. A method for determining the true velocity of sound in an anisotropic material as a function of orientation comprising the steps of obtaining a plurality of respective samples of said material along at least three mutually perpendicular axes therethrough, sequentially positioning each of said respective samples between an ultrasonic transmitter and an ultrasonic receiver in a sound coupling liquid, slowly rotating each of said samples during the time each sample is positioned between said transmitter and receiver, sequentially deriving a series of polar plots as a function of orientation from the output of said ultrasonic receiver for each of said samples during the time each of said rotating samples is in position between said transmitter and receiver, and determining said true velocity of sound in said anisotropic material for a desired orientation from said polar plots, whereby said true velocity can subsequentially be utilized in a spectral analysis method for quantitatively determining the size and location of flaws within another sample of said material.

4,106,328
PORTABLE PROVER BARREL

Harry B. Neeff, 1530 E. "C" St., Casper, Wyo. 82602

Filed Oct. 6, 1977, Ser. No. 834,334
Int. Cl.² G01F *25/00*
U.S. Cl. 73—3 **10 Claims**



1. A portable prover barrel apparatus, said apparatus comprising:

a lower section with left and right tubes, each of the aforesaid tubes being horizontal and parallel to each other and terminating in a vertical upstanding tubular rear end and in a vertical upstanding tubular connector at the front end,

a wheel assembly connected to said lower section, said wheel assembly comprising:

(a) an axle,

(b) wheels operatively connected to opposing ends of said axle, and

(c) means engaging the mid-section region of said left and right lower section tubes for mounting said lower section to said axle,

an upper section with left and right tubes, each of the aforesaid tubes being horizontal and parallel to each other and terminating, at the rearward end, in a downwardly extending vertical tubular connector,

a U-shaped tubular portion operatively interconnected with the forward ends of said upper section left and right tubes, said upper section and said U-shaped tubular portion being positioned above and parallel to said lower section left and right tubes,

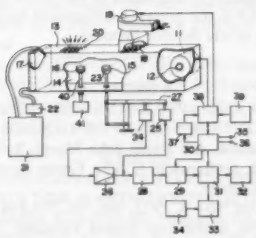
a fifth wheel male assembly mounted to said upper section left and right tubes near said U-shaped portion, and

means for connecting said lower's upstanding connector to said upper section's downwardly extending connector.

4,106,329
SOLID OR WATER QUANTITY MEASUREMENT APPARATUS USING MICROWAVES

Yoshiyuki Takahashi, Aikawamachi; Akihiko Nagai, Ebina; Shigenobu Kawawa, Machida; Hidetaka Kubozono, and Mitsuo Tanaka, both of Atsugi, all of Japan, assignors to Anritsudenki Kabushikigaisha, Tokyo, Japan

Filed Apr. 26, 1977, Ser. No. 790,992
Claims priority, application Japan, Apr. 26, 1976, 51-46514
Int. Cl.² G01N *5/04*
U.S. Cl. 73—15 B **13 Claims**



1. A solid or water quantity measurement apparatus using microwaves, comprising:

a waveguide forming an oven with an inner space and two ends, at one end of which a microwave oscillator is assembled and at the other end of which a dummy is assembled;

a balance having a weight detection plate in said waveguide and assembled with said waveguide;

means for discharging evaporated water in said waveguide away from said waveguide; and

a sample plate attachable on and detachable from said weight detection plate in said waveguide.

4,106,330
TENSION SENSOR

Donald R. Hinrichs, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

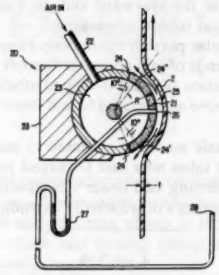
Filed Apr. 12, 1977, Ser. No. 786,894
Int. Cl.² G01L *5/04*
U.S. Cl. 73—37.7 **8 Claims**

3. A method for determining tension within a thin, flexible

member by utilizing a device which includes an enclosure, said enclosure having a porous and permeable wall section adapted for passing a gas flow therethrough with an axial dimension substantially smaller than its radial dimension, and a probe extending to the outer surface of said active surface of said enclosure, comprising the successive steps of:

providing a continuous flow of gas into said enclosure so that said gas flow exits from said enclosure through said porous wall section,

bringing said device into close proximity with said flexible member such that the axis of said device is perpendicular to the direction along which tension is to be measured and



such that the gas flowing from said porous wall section concentrically and elastically deflects said member away from said section,

measuring the static pressure in the passageway defined by the outer surface of said porous wall section and the concentrically deflected surface of said member, and

computing the tension within said member according to the relationship

$$T = R(\Delta P)$$

where T is tension, R is the radius of the active surface of the enclosure and ΔP is the pressure differential between the opposing surfaces of the flexible member.

4,106,331

METHOD AND APPARATUS FOR DETECTING CONTAMINATION OF LIQUIDS

John Darrah Bunton, and David John Marsh, both of Bromsgrove, England, assignors to G.K.N. Group Services Limited, Smethwick, England

Filed May 6, 1977, Ser. No. 794,658

Claims priority, application United Kingdom, May 6, 1976, 18548/76; Jul. 9, 1976, 36963/76

Int. Cl.[2] G01N *25/00, 33/28*

U.S. Cl. 73—61.1 R **4 Claims**

1. A method of detecting fluid contaminants in a liquid comprising the steps of

heating a temperature sensing element to a relatively high initial temperature;

immersing said sensing element in a sample of the liquid to be tested;

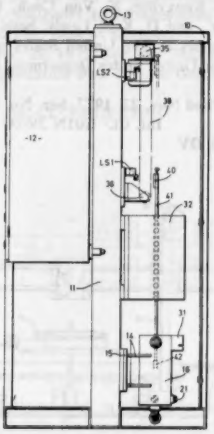
allowing said sensing element to cool naturally in said liquid until a first predetermined temperature below said initial temperature is reached;

initiating timing means in response to the element reaching said first predetermined temperature;

allowing said sensing element to continue cooling naturally in said liquid until a second predetermined temperature is reached;

measuring the time interval between the initiation of the timing means and the sensing element reaching said second predetermined temperature;

and comparing said time interval with a time interval representing the rate of cooling of the sensing element in a sample of the liquid having an acceptable level of contamination, between the same first and second predetermined temperatures, said first and second predetermined temperatures being selected, in accordance with the type of



liquid to be tested, as delimiting a range of temperatures over which the presence of fluid contaminants in the liquid causes a substantial measurable deviation from the normal cooling power of the liquid.

4,106,332

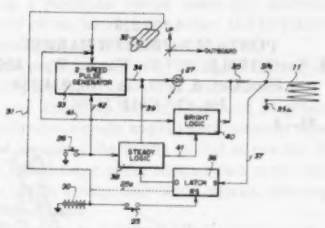
RECORDING MONITOR FOR STRUCTURE FAULTS

William L. McKeown, Euless, Tex., assignor to Textron, Inc., Providence, R.I.

Filed Apr. 4, 1977, Ser. No. 784,146

Int. Cl.[2] G08B *21/00*

U.S. Cl. 73—104 **7 Claims**



1. A crack detection system for aircraft structure having a normally conductive test circuit affixed to said structure and subject to being temporarily rendered noncontinuous under stress and to regaining continuity when stresses are removed which comprises:

(a) an oscillator for periodically applying a search pulses to said test circuit and including a visual indicator energized by current flow due to each pulse,

(b) latch means connected to said test circuit and responsive to high voltage levels for setting a circuit condition therein, and

(c) test means for utilizing said condition for actuating said oscillator to energize said indicator in a first sense responsive to said condition and in a second sense when said condition is nonexistent.

4,106,333

METHOD OF AND APPARATUS FOR EXAMINING THE ROUGHNESS OF SURFACES

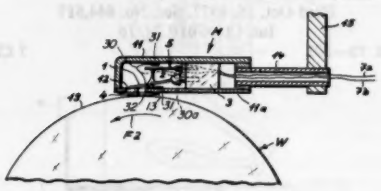
Ernst Saljé, Schulheide 4, D.2106 Bendestorf, Germany, and Heinrich Mushardt, Ahstedt, Germany, assignors to Ernst Saljé, Bendestorf, Germany

Filed Aug. 9, 1976, Ser. No. 712,829

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1975, 2535912

Int. Cl.[2] G01B *5/28*

U.S. Cl. 73—105 17 Claims



1. A method of examining roughness of a surface of a workpiece utilizing a sensing element means for providing mechanical movement in response to the roughness of said surface, and support element means for holding said sensing element means and having a natural frequency of oscillation, said method comprising the steps of:

effecting relative movement between said sensing element means and said workpiece surface;

engaging said workpiece surface by said sensing element means, causing said sensing element means to be stimulated by said relative movement such that said support element means oscillates at said natural frequency; and

producing a value corresponding to the magnitude of said oscillation, said value indicative of the roughness of said surface.

4,106,334

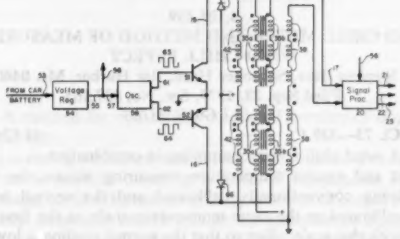
TORQUE TRANSDUCER WITH CLOSELY COUPLED PRIMARY WINDINGS

George Henry Studtmann, Mt. Prospect, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed May 16, 1977, Ser. No. 797,208

Int. Cl.[2] G01L *3/10*

U.S. Cl. 73—136 A 7 Claims



1. An indicating system for providing an information signal regarding at least one characteristic of a rotatable shaft, comprising:

a transducer, including first, second, and third physically separated magnetic cores, a first primary winding wound on the first magnetic core, a second primary winding wound in a closely coupled manner adjacent the first winding on the first magnetic core, a first secondary winding disposed on the second magnetic core, and a second secondary winding disposed on the third magnetic core, with means for connecting both secondary windings to produce the information signal when the primary windings are energized;

first and second switches, each connected to complete a circuit for current flow through one of the primary windings when that switch is actuated; and

means for regulating operation of the switches to provide an energizing flux adjacent the first magnetic core, to develop the information signal in said secondary winding.

4,106,335

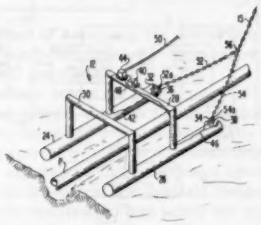
SEA SLED TOW LINE VECTOR SYSTEM

Harry H. Shatto, Laguna Beach, Calif., assignor to Santa Fe International Corporation, Orange, Calif.

Filed Dec. 27, 1976, Ser. No. 753,983

Int. Cl.[2] G01L *5/10*

U.S. Cl. 73—143 66 Claims



61. In a subsurface towing system, wherein a subsurface body is towed by a surface tow vessel, said towed body and surface vessel being connected by cable means, a method of remotely monitoring the attitude of said towed body, comprising:

measuring first and second non-colinear forces acting between said cable means and said towed body at the location where said cable means is coupled to said towed body; and

determining the deviation of said cable means relative to reference axis of said towed body from said measured first and second forces.

4,106,336

FULL-SEASON RAIN GAUGE HAVING REPLACEABLE CHARTS FOR MAKING PROFILE GRAPHS

Clement F. Marley, P.O. Box 93, Nokomis, Ill. 62075

Filed Nov. 10, 1976, Ser. No. 740,761

Int. Cl.[2] G01W *1/14*

U.S. Cl. 73—171 6 Claims

1. A rain gauge comprising: a support panel, a vertically disposed translucent season-height gauge tube mounted on said panel, a shorter translucent gauge tube attached co-axially above to said season-height tube, the interconnection between

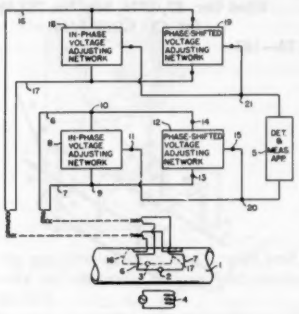
said tubes being constructed and arranged to facilitate discharge of rain water from said shorter tube into said season-height tube, and a calibrated record chart removably and replaceably mounted laterally adjacent said tubes and adapted for subsequent juxtapositioning with similar charts for providing a seasonal rain-profile graph.

4,106,337

MAGNETIC FLOW METER NULLING SYSTEM

Harry Louis Trietley, Jr., Brighton, N.Y., assignor to Sybron Corporation, Rochester, N.Y.

Filed May 19, 1976, Ser. No. 687,674
Int. Cl.[2] G01F *1/60*
U.S. Cl. 73—194 EM **2 Claims**


IN-PHASE VOLTAGE ADJUSTING NETWORK
PHASE-SHIFTED VOLTAGE ADJUSTING NETWORK
IN-PHASE VOLTAGE ADJUSTING NETWORK
PHASE-SHIFTED VOLTAGE ADJUSTING NETWORK
DET & MEAS APP

1. An electromagnetic flowmeter system, including in combination,

a. a primary element for producing an electrical potential difference proportional to the flow rate of flowing electrically-conductive material, and

b. a detecting and measuring circuit for measuring said electrical potential difference such as to produce a measure of the rate of flow of said material through said primary element;

c. said primary element having field means for producing an AC magnetic field in the path of said material and for directing said field transverse to the direction in which said material flows through said primary element;

d. said primary element having a first electrode, the electrical potential of which is due to voltage at a first location in said material, due to flow of said material through and transverse to the direction of said field;

e. said primary element having a second electrode, the electrical potential of which is due to voltage at a second location in said material, due to said flow of said material, said locations being spaced one from the other along a line transverse to said flow;

f. said primary element having a first lead circuit connected to said first electrode and a first output terminal for presenting a first output voltage corresponding to the potential of said first electrode;

g. said primary element having a second lead circuit connected to said second electrode and having a second output terminal for presenting a second output voltage corresponding to the potential of said second electrode;

h. said first lead circuit having therein an adjusting element for adjusting the amplitude of said first output voltage with respect to the potential of said first electrode;

i. said second lead circuit having therein an adjusting element for adjusting the amplitude of said second output voltage, with respect to the potential of said second electrode;

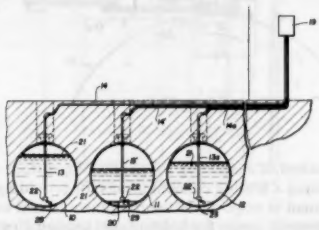
j. said first lead circuit also having an adjusting element for adjusting the phase of said first output voltage with respect to the phase of said second output voltage; each said lead circuit comprising a pick-up loop, said loop incorporating the corresponding said electrode, and each said lead circuit including therein, remote from the corresponding said electrode, a potentiometer of which the slide wire is a series element of such loop, said slide wire being connected to an input terminal of said detecting and measuring circuit.

4,106,338

WATER DETECTOR MEANS FOR TANK LIQUID LEVEL MEASURING SYSTEM

John H. Castle, Tulsa, Okla., assignor to Control Marketing Associates, Tulsa, Okla.

Filed Oct. 21, 1977, Ser. No. 844,517
Int. Cl.[2] G01F *23/16*
U.S. Cl. 73—302 **7 Claims**



1. In a liquid level measuring system for liquid storage vessels, a liquid level measuring gage, a conduit connected with said gage and projecting into a liquid storage vessel near the bottom thereof, and pumping means common to a compression chamber of the gage and said conduit and operable to evacuate liquid from the conduit by pressure while simultaneously pressurizing the compression chamber of said gage, the improvement comprising a float valve means on the lower end of the conduit near the bottom of the liquid storage vessel and adapted in an open condition to uncover an orifice communicating with the conduit, and in a closed condition to cover said orifice whereby pressure in the conduit developed by said pumping means increases and causes said gage to provide a maximum reading indicating the presence in the bottom of the storage vessel of a contaminating liquid having a specific gravity greater than that of the stored liquid in the vessel above the contaminating liquid, said float valve means having a float element which is adapted to float in the contaminating liquid and which sinks in said stored liquid of lesser specific gravity.

4,106,339

WIND CHILL METER AND METHOD OF MEASURING WIND CHILL EFFECT

John Stephen Baer, Schooner Head, Bar Harbor, Me. 04609

Filed Sep. 28, 1977, Ser. No. 837,103
Int. Cl.[2] G01K *13/00*
U.S. Cl. 73—339 C **14 Claims**

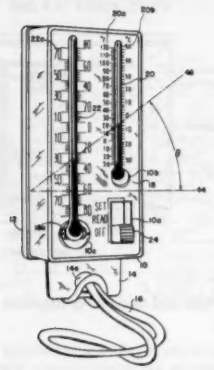
1. A wind chill meter comprising in combination

first and second temperature measuring means, the first being conventionally calibrated and the second being calibrated in the same temperature scale as the first but with that scale offset so that the normal reading is low by an amount representative of a preselected chill effect,

heater means associated with the second temperature measuring means, having appropriate energizing means,

means for selectively energizing said heater means so that at one selection position, upon energizing the heater means, the indication of the second temperature measuring means can be made to rise to the level calibrated to correspond to the temperature shown on the first temperature measuring means and in a second selection position that level can be maintained in the absence of wind, and

wind shield means for selectively shielding at least heater means associated with the second temperature measuring



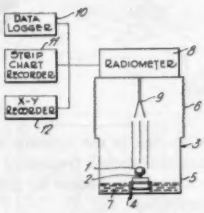
means or permitting the wind to cool said heater means associated with said second temperature measuring means.

4,106,340

GRADING AGRICULTURAL PRODUCTS WITH A MICROWAVE ANTENNA

Michael A. Hamid, Winnipeg, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed Oct. 1, 1976, Ser. No. 728,651
Claims priority, application Canada, Apr. 7, 1976, 249712
Int. Cl.[2] G01J 5/46; H04B 7/00
U.S. Cl. 73—355 R **5 Claims**



1. A method for contactless grading a plurality of objects, comprising:

(a) scanning a selected said object with a microwave radiometric antenna means at a series of frequencies in the range 12–18 GHz and measuring radiometric output intensity from said object to thereby establish an optimum frequency corresponding to maximum radiometric output;

(b) sequentially bringing a plurality of said objects into close proximity with said antenna means and effecting relative movement therebetween so as to scan each of said objects;

(c) measuring the radiometric output intensity for each said object at said optimum frequency to thereby establish a signature for each said object; and

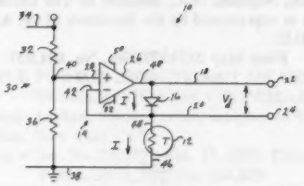
(d) relating said signatures to a preselected non-electric parameter of said object whereby said objects may be graded by comparing their respective signatures to a standard established for that parameter.

4,106,341

LINEARIZED THERMISTOR TEMPERATURE MEASURING CIRCUIT

Juan de J. Serrano, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Jan. 3, 1977, Ser. No. 756,233
Int. Cl.[2] G01K 7/24
U.S. Cl. 73—362 AR **11 Claims**



11. A method of linearizing the output of a thermistor having an exponential resistance-temperature characteristic, which method comprises:

sensing voltage across the thermistor;

controlling current through the thermistor as required to maintain the sensed voltage substantially constant; and

supplying current to a forwardly biased decoder diode having an exponential current-voltage characteristic in response to the current through said thermistor;

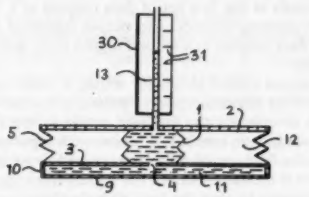
whereby the resultant voltage across the decoder diode is a substantially linear function of the temperature sensed by the thermistor.

4,106,342

PRESSURE MEASURING APPARATUS

Onni Söre Sörmunen, Boovagen 53, 13200 Saltsjo-Boo, Sweden

Filed Apr. 14, 1977, Ser. No. 787,671
Int. Cl.[2] G01L 7/06
U.S. Cl. 73—386 **5 Claims**



1. A pressure measuring apparatus, useful as a barometer, comprising

a first variable volume vessel containing a gas, said first vessel being extendable and retractable between a first end and a second end thereof, the pressure to be measured acting on said first vessel

a second variable volume vessel containing a substantially incompressible liquid, said second vessel being extendable and retractable between a first end and a second end thereof,

a riser tube communicating with the interior of said second vessel for indicating the pressure acting on said first vessel,

a first member joined to said first end of said first vessel and a second member joined to said second end of said first vessel,

said first end of said second vessel being joined to one of said members,

said second end of said second vessel being joined to the other of said members,

said members being relatively movable toward and away from each other in parallel relationship

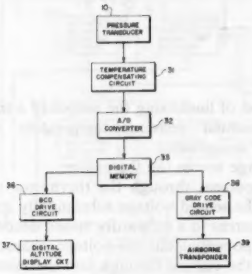
whereby a temperature induced pressure variation of said gas and a temperature induced volume variation of said liquid compensate each other.

4,106,343

SOLID STATE BAROMETRIC ALTIMETER-ENCODER

Harry Cook, Neptune, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 31, 1977, Ser. No. 801,937
Int. Cl.[2] G01L 7/14
U.S. Cl. 73—387 **4 Claims**



1. A barometric altimeter-encoder which comprises:

pressure sensing means to electronically sense pressure and to generate an analog voltage signal which is proportional to the applied atmospheric pressure;

analog-to-digital converter means to convert said analog voltage signal into a corresponding digital pressure signal;

memory means including look-up table means, having address inputs, a first set of data outputs, and a second set of data outputs, with connections from the analog-to-digital converter means to said address inputs, so that for each possible value of the digital pressure signal there are output signals at the first set of data outputs in a first digital code indicating altitude, and output signals at the second set of data outputs in a second digital code also indicating altitude;

baroset digital switch means for setting a value representing the current site atmospheric pressure, baroset converter means to convert the last said value to the first digital code, arithmetic combining means with input connections from the first set of data outputs and from the baroset converter means to correct the signals from the first set of data outputs to give the true altitude above sea level;

display means to visually display the output from said combining means;

and a transponder having inputs from said second set of data outputs for transmitting signals representing the altitude in said second digital code to a remote receiver.

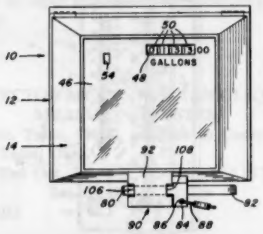
4,106,344

HOUSING FOR ELECTRO-MECHANICAL COUNTER

Eberhard Moll, Magstadt, Fed. Rep. of Germany, assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Jun. 27, 1977, Ser. No. 810,335
Int. Cl.[2] G01D 11/24
U.S. Cl. 73—431 **4 Claims**

1. A tamperproof housing for a remote counter comprising, a base member molded of impact-resistant material having provision for mounting said counter, and a cover member of impact-resistant material having interengaging portions when assembled with said base, said interengaging portions being tongue and groove members on one mating surface of said base and said cover, and upstanding leg members projecting from an opposed surface of said base, said leg members cooperating with said cover to retain said tongue and groove members in assembled relation, and a locking pin integral with said base for



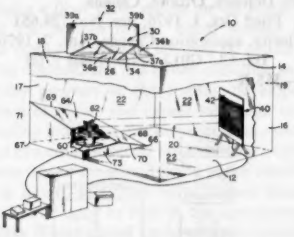
retaining said base and said cover together when said members are assembled.

4,106,345

SIMULATION FACILITY FOR DYNAMICALLY TESTING GUIDANCE SYSTEMS WHICH USE RADIOMETRIC FREQUENCIES

Ronald A. Saunders, 27626-145 Pl. SE., Kent, Wash. 98031, and Donald A. Willard, 2766 Westlake N., Seattle, Wash. 98101

Filed Aug. 3, 1977, Ser. No. 821,607
Int. Cl.[2] G01S 11/00
U.S. Cl. 73—432 SD **9 Claims**



1. A simulator for use in the dynamic testing of guidance systems which use radiometric frequency energy emitted by the components of a terrestial scene for guidance information, the simulator comprising:

a chamber, wherein said chamber (1) has interior surfaces which have a low emissity at radiometric frequencies, and (2) includes an opening to a heat sink capable of receiving radiometric frequency energy from said chamber, so that a low background level of radiometric frequency energy is maintained in said chamber;

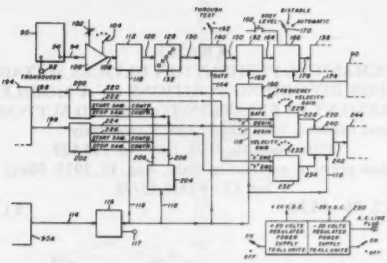
an array of radiometric energy means located in said chamber for producing in operation a variable-intensity pattern of radiometric frequency energy, said pattern simulating the pattern of radiometric frequency energy produced by the components of a particular terrestial scene, wherein in simulator operation, the radiometric frequency energy produced by said array is directed toward a sensor located in said chamber; and

a low-emissity reflecting surface means located in said chamber in such a manner that said surface means reflects a substantial portion of the radiometric frequency energy produced by said array not otherwise captured by the sensor out of said chamber through said opening.

4,106,346
GREY-LEVEL ULTRASONIC IMAGING

Terrance Matzuk, 154 Eileen Dr., Pittsburgh, Pa. 15214

Filed Mar. 23, 1977, Ser. No. 780,277
Int. Cl.[2] G01N *29/04*
U.S. Cl. 73—614 47 Claims

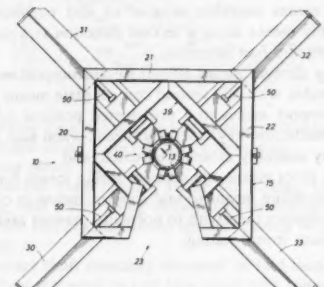


40. A method of ultrasonic grey-level imaging comprising:
amplifying electrical signals which are related to acoustical waves received by an ultrasonoscope from a test specimen,
converting said amplified electrical signals to positive voltage signals monotonically related to said amplified electrical signals,
converting said positive voltage signals to non-linear function signals,
producing modulated dot width output signals having dot widths generally proportional to the amplitude of said non-linear function signals,
controlling the spacing between said dots by tone-burst generator signals, and
displaying said modulated dot width output signals.

4,106,347
ULTRASONIC INSPECTION APPARATUS FOR TUBULAR MEMBERS AND METHOD

Deke E. DeKerlegand, Lafayette, La., assignor to W. C. Lamb, Lafayette, La.

Filed Aug. 10, 1977, Ser. No. 823,509
Int. Cl.[2] G01N *29/04*
U.S. Cl. 73—622 13 Claims

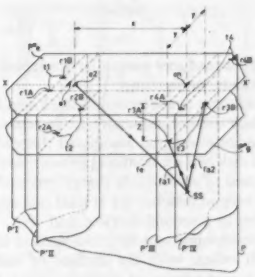


1. In an ultrasonic inspection apparatus of the type having a frame with a central vertical passage for receiving a substantially vertically disposed pipe, a plurality of wheel search units each operatively associated with a respective search unit assembly and adapted to be ultrasonically coupled to the pipe by urging such units into contact with the pipe in the presence of a selected coupling fluid, an improved search unit assembly for each search unit comprising:
a substantially horizontally disposed fluid cylinder longitudinally directed toward the centerline axis of the central vertical passage and having an extendable and retractable member extending therefrom;
a wheel search unit secured to said member for horizontal movement therewith into and out of ultrasonic coupling engagement with the pipe; and
means for supplying a substantially constant pressure to said fluid cylinder.

4,106,348
DEVICE FOR EXAMINATION BY MEANS OF ULTRASONIC VIBRATIONS

Michel Joseph Auphan, Paris, France, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 550,957, Feb. 19, 1975. This application Feb. 1, 1977, Ser. No. 764,585
Claims priority, application France, Feb. 20, 1974, 74 05718
Int. Cl.[2] G01N *29/04*
U.S. Cl. 73—624 3 Claims



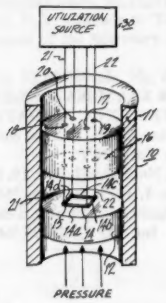
1. A device for ultrasonic examination of a body situated in an analysis plane, comprising:
a plurality of transmission transducers situated in a row lying in the analysis plane and having a direction of transmission in the analysis plane toward the body:
means for pulsing the transmission transducers one at a time in a predetermined spaced sequence for launching ultrasonic pulses therefrom toward the body;
a plurality of receive transducers situated in each of a plurality of parallel planes which are perpendicular to the row of transmission transducers, the receive transducers being oriented to detect echo pulses reflected from interfaces in the body;
means for determining the depth of an interface, connected to receive signals from said receive transducers, which function to determine the depth of an interface reflecting an echo pulse with respect to the row of transducers from the time of detection of the echo pulse and the position of the detecting receive transducer with respect to the position of the transmission transducer that launched the detected pulse; and
means for displaying, connected to receive signals representing the depth of the interface from the means for determining the depth, which function to display detected echo pulses as image points on a screen, the positions of image points in one rectangular coordinate direction corresponding to the positions of the receive transducers detecting the corresponding echo pulses along the direction of the row of transmission transducers and in the other rectangular coordinate direction corresponding to the determined depths of the reflective interfaces, the image points together forming an image of the reflective interfaces of the body which intersect the analysis plane.

4,106,349

TRANSDUCER STRUCTURES FOR HIGH PRESSURE APPLICATION

Anthony D. Kurtz, Englewood, N.J., assignor to Kulite Semiconductor Products, Inc., Ridgefield, N.J.

Filed Nov. 3, 1977, Ser. No. 848,159
Int. Cl.[2] G01L *9/06*
U.S. Cl. 73—746 **10 Claims**



1. A pressure transducer particularly adapted for high pressure measurements, comprising:

(a) a first disk of a predetermined thickness having located on a surface thereof, a piezoresistive sensor element having at least one terminal associated therewith,

(b) a second disk of a substantially greater thickness than said first disk and of a relatively congruent surface configuration, said second disk having at least one aperture directed from a first to a second surface, and

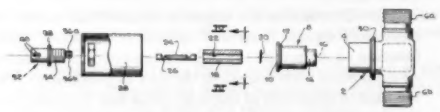
(c) means positioning said first and second disks in contact with each other, with the surface of said first disk as containing said sensor, in contact with a surface of said second disk containing said aperture, with said aperture overlying said terminal and, a lead directed through said aperture and in contact with said terminal.

4,106,350

THIN WIRE PRESSURE SENSOR

Richard T. Morris, 4820 W. 118th St., Hawthorne, Calif. 90250, and Arthur H. Wildvank, 12516 Destino St., Cerritos, Calif. 90701

Filed Aug. 29, 1977, Ser. No. 828,317
Int. Cl.[2] G01L *21/12*
U.S. Cl. 73—755 **22 Claims**



1. Apparatus for sensing gas pressure comprising:

a structure defining a gas passageway,

a pressure-sensitive, thin resistance wire having a measurable resistance response to pressure changes within a selected pressure regime,

means mounting said wire in a substantially stationary generally longitudinal position within said passageway,

a pair of electrical contact means respectively making contact with spaced portions on said wire, for applying to said wire an electrical input signal and inducing therein an output response signal representing the then prevailing resistance value of said wire, and

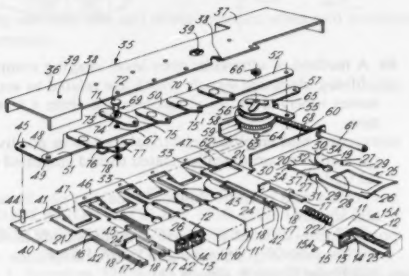
baffle means supported within said passageway near an end of the wire for shielding said wire from direct impact by gas traversing said passageway in response to changes in the sensed pressure.

4,106,351

MECHANICAL PUSHBUTTON DEVICES SUITABLE FOR RECORDING POSITIONS OF A MOBILE ELEMENT IN RELATION TO A FIXED SUPPORT

Giovanni Santoro, Via Gradoli 105, Roma, Italy

Filed Aug. 10, 1976, Ser. No. 713,129
Claims priority, application Italy, Aug. 11, 1975, 50919 A/75
Int. Cl.[2] F16H *35/18*
U.S. Cl. 74—10.33 **3 Claims**



1. Pushbutton control apparatus comprising:

pushbutton key assembly means actuable along a first direction, said pushbutton key assembly means including a housing having a first cavity and a second cavity, first control plate means associated with said first cavity for guiding said pushbutton key assembly means, said first control plate means having a first end and a second end, said first end being U-shaped and having at least one tooth toward the outside of each arm thereof, and said second end having a completely enclosed aperture, said pushbutton key assembly means further including second control plate means;

support means movable relative to said pushbutton key assembly means along a second direction at a substantial angle to said first direction;

recording element means affixed to said support means and cooperable with said second control plate means to move said support means to a preselected position relative to said pushbutton key assembly means when said pushbutton key assembly means is actuated; and

blocking pivot means and resilient spring means for affixing said recording means to said support means in close frictional contact therewith to normally prevent said recording means from rotating.

4,106,352

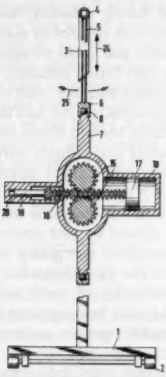
WIRE POINTING MACHINE

Walter Arndt, Meschede, Fed. Rep. of Germany, assignor to Firma Friedrich Krollmann, Altena, Fed. Rep. of Germany

Filed Apr. 1, 1977, Ser. No. 783,847
Int. Cl.[2] F16H *19/04*
U.S. Cl. 74—29 **10 Claims**

1. A wire pointing machine having two grooved rolls, cha-

racterised in that the two grooved rolls are supported in a gear ring which can be pivoted about a horizontal axis, teeth being



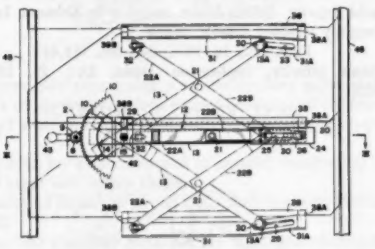
provided on end trunnions of the grooved rolls which mesh with a common gear rack which is directly powerdriven.

4,106,353

DEVICE FOR MOVING CURVED PLATE BENT IN A SUBSTANTIALLY ARCUATE-SHAPE ALONG CURVED PATH

Osamu Kondo, Aichi, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Apr. 14, 1976, Ser. No. 676,959
Claims priority, application Japan, Aug. 13, 1975, 50-98689
Int. Cl.[2] F16H *21/18*
U.S. Cl. 74—45 **5 Claims**



1. A device for moving a curved plate bent in a substantially arcuate-shape along a curved path comprising:

(a) a base panel;

(b) a curved plate holding frame for holding said curved plate, said frame being disposed in substantially parallel relation and predetermined spaced relation with said base panel;

(c) a rotary shaft rotatably mounted on said base panel;

(d) a pivot mounted on said base panel with the axis thereof disposed parallel with that of said rotary shaft;

(e) arm means pivotably mounted at an intermediate portion thereof on said pivot;

(f) a guide pin protruding laterally from one end of said arm means;

(g) rotation transmission means for transmitting the rotation of said rotary shaft to the other end of said arm means opposite to said one end thereby causing swinging movement of said arm means around said pivot;

(h) arm bracket means secured to said curved plate holding frame and having a portion bent away at a predetermined angle from said curved plate holding frame toward said one end of said arm means, an extension line from said bent portion making an acute angle with the axis of said pivot, said arm bracket means having a guide slot formed at said bent portion and elongated in the direction of said extension line, said guide slot being adapted for guiding said guide pin on said arm means for movement along said slot; and

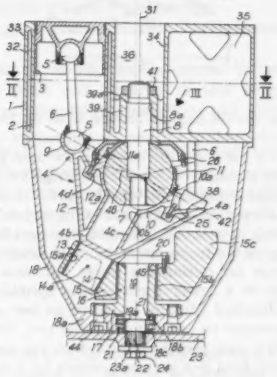
(i) curved plate guiding means for guiding the curved plate along a predetermined curved path defined thereby, so that as said arm means rotates, said curved plate holding frame is adapted to move substantially parallel to the curvature of the curved plate.

4,106,354

RECIPROCATING ENGINES, PUMPS OR COMPRESSORS

Marius G. Girodin, La Fontaine Peureuse, 78580 Bazemont, France

Filed Nov. 5, 1974, Ser. No. 521,201
Claims priority, application France, Nov. 9, 1973, 73 39814
Int. Cl.[2] F16H *23/00*
U.S. Cl. 74—60 **10 Claims**



1. A machine comprising a cylinder block having a plurality of cylinders disposed around the axis of the block with the axes of the cylinders being at least substantially parallel with the axis of said block, a hollow casing secured to said block in generally axial alignment therewith, said cylinders being positioned equidistant from the said axis of said block and from each other, a straight rotating shaft rotatably mounted in said casing disposed co-axially with the axis of the block, a movement transformer mounted in said casing and having a widened end and an opposed reduced end, a swivel bearing swivelably connecting the widened end of the transformer to the block, pistons mounted in the cylinders, swivelled connecting rods individually and swivelably connecting each piston to the periphery of the transformer, a connection element located between said rotating shaft and the reduced end of the transformer, the widened end of the movement transformer constituting a portion of the swivel bearing, the other portion of which is rigid with the cylinder block, and said straight rotating shaft being disposed in said casing co-axially with the axis of the cylinder block adjacent to the reduced end of the movement transformer, said connecting element comprising crank means for connecting the shaft to the said reduced end, said crank means being secured to the shaft for rotationg therewith and having articulation means for rotatably receiving said reduced end of the transformer, with the axis of said articulation means passing through the center of the swivel bearing, strut means associated with each of said pistons for connecting the widened end of the movement transformer to the reduced end, one portion at least of said strut means being situated at least approximately in line with a respective connecting rod when its associated piston is in its innermost position in its

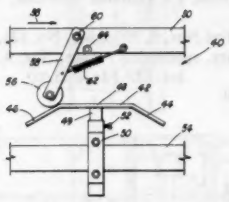
cylinder, toothed bevel gear concentric with the axis of the transformer and carried within the widened end thereof, and a toothed bevel gear coaxial with the axis of said block and located to engage with at least one tooth of the toothed gear of the transformer.

4,106,355

RAMP DEVICE TO REDUCE WEAR ON TROJAN BAR DOGS AND WHEEL LUGS IN AN IRRIGATION VALLEY CENTER PIVOT WATER DRIVE

Jerry H. Cox, Rte. 1, Box 101, and Robert F. Thomas, Rte. 1, Box 66, both of Hugoton, Kans. 67951

Filed Sep. 23, 1976, Ser. No. 725,774
Int. Cl.[2] F16H *21/44*
U.S. Cl. 74—99 A 6 Claims



1. A ramp device used to reduce wear on trojan bar dogs mounted on the ends of a trojan bar and reduce wear on wheel lugs driven by the dogs, the ramp device used in conjunction with a wheel mounted self-propelled irrigation sprinkler, the trojan bar dogs engaging the wheel lugs for driving the sprinkler wheels during the drive stroke of the trojan bar, the trojan bar dogs riding over the top of adjacent wheel lugs during the return stroke of the trojan bars, the ramp device comprising:

ramp means for raising the trojan bar, said ramp means attached to a tower frame of the sprinkler, said ramp means disposed adjacent to the trojan bar; and

a roller mounted on one end of a roller arm, the other end of said roller arm pivotly mounted on the trojan bar, said roller arm held in a vertical position by a stop secured to the trojan bar during the return stroke of the trojan bar so that said roller when contacting the surface of said ramp means raises the trojan bar; and

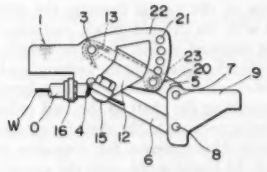
a spring attached to said roller arm and the trojan bar for biasing said roller arm against said stop.

4,106,356

DERAILER FOR A BICYCLE

Masashi Nagano, and Hideaki Fujimoto, both of Sakai, Japan, assignors to Shimano Industrial Company Limited, Osaka, Japan

Filed Nov. 1, 1976, Ser. No. 737,670
Claims priority, application Japan, Jan. 12, 1976, 51/3005
Int. Cl.[2] F16H *11/04*
U.S. Cl. 74—217 B 25 Claims



1. A derailleur for a bicycle, which is adapted to shift a driving chain to one of two or more sprockets by operating a control wire to thereby change the bicycle speed, comprising:

(a) three members including a first fitting member, a second connecting member pivoted to said first fitting member, and a third movable member pivotably supported to said connecting member and provided with a chain guide means, said connecting member being swingable with respect to said fitting member, said movable member being swingable with respect to said connecting member and movable back and forth co-axially of said sprockets with respect to said fitting member,

(b) at least one control member, said control member being swingably independently from said third movable member and having secured thereto either said control wire or an outer cable guiding said control wire,

(c) a spring between said control member and said connecting member, said spring transmitting a force from said control member to said movable member when said control member is moved by said control wire or cable, said spring when energized energizing said movable member to shift axially in one direction when said control member swings independently of said movable member, the strength of said spring being greater than the force needed to shift the movable member under normal pedaling conditions of the bicycle, and

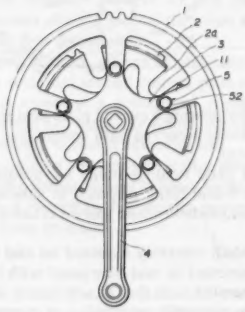
(d) a positioning means provided between said control member and one of said three members and serving to positionally set said chain guide means, said positioning means comprising a holder provided on one of said control member and one of said three members, said holder having a plurality of set positions; and a retainer provided on either of said control member or one of said three members not carrying said holder and being engageable with any one of said set positions, means biassing the retainer to the holder with a force greater than that of the spring so that when energy stored in the spring is later released by the connecting member swinging to abut the control member, the retainer will stay in engagement with the holder.

4,106,357

MULTISTAGE GEAR CRANK FOR A BICYCLE

Takashi Segawa, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Dec. 16, 1976, Ser. No. 751,443
Claims priority, application Japan, Dec. 29, 1975, 50-180305[U]
Int. Cl.[2] F16H *55/30;* B21D *53/26*
U.S. Cl. 74—243 DR 2 Claims



1. A multistage gear crank for a bicycle, comprising

at least two chain gears of different pitch diameters,

a mounting plate for connecting said chain gears at a regularly spaced interval therebetween by means of a fixing means, and

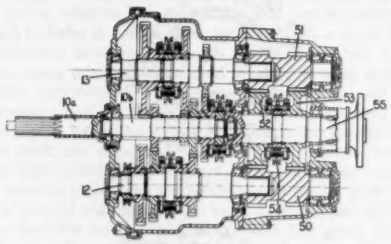
a crank body having a boss to which said mounting plate is fixed; said larger diameter chain gear being ring shaped, having an inner diameter larger than the diameter of the addendum circle of the smaller diameter chain gear, and having a plurality of mounting portions extending radially

from the inner periphery of said larger diameter chain gear; each mounting portion being provided at its end with a mounting bore; said mounting plate having at its center a bore engageable with said boss of the crank body and at its periphery legs which are as many in number as said mounting portions, said legs having bores at the ends thereof; said smaller diameter chain gear having at its center a through hole contoured similarly to said mounting plate, peripheral cutouts contoured similarly to said mounting portions of the larger diameter chain gear, and at substantially radially intermediate portions mounting bores as many in number as said mounting portions, said bores in said larger diameter chain gear, said smaller diameter chain gear and said mounting plate being coincidental.

4,106,358
GEAR BOXES

William McKenzie Meek Morrison, Wolverhampton, England, assignor to Turner Manufacturing Company, Ltd., England

Continuation of Ser. No. 340,282, Mar. 12, 1973, abandoned. This application Jun. 7, 1976, Ser. No. 693,476
Claims priority, application United Kingdom, Mar. 17, 1972, 12533/72
Int. Cl.[2] F16H *3/08*
U.S. Cl. 74—331 **1 Claim**



1. A gear box comprising a relatively long input shaft, a relatively short output shaft in coaxial relation and operatively connected with said input shaft and relatively rotatable therewith,

two spaced lay shafts disposed in parallel relationship with said input and output shafts,

a plurality of fixedly mounted input shaft gears on said input shaft,

at least one rotatably mounted lay shaft gear disposed on each of said respective lay shafts and permanently meshing with a corresponding one of said fixedly mounted input shaft gears,

at least one rotatably mounted input shaft gear on said input shaft,

at least one fixedly mounted lay shaft gear disposed on at least one of said lay shafts and permanently meshing with said rotatably mounted input shaft gear,

two output shaft gears rotatably mounted on said output shaft,

two further fixedly mounted lay shaft gears disposed on each of said respective lay shafts towards one end thereof and each permanently meshing with one of said two output shaft gears,

means for alternatively engaging one of said output shaft gears for operative transmission of torque between the two lay shafts and the output shaft;

a synchronizer on said input shaft for engaging said input shaft with said input shaft rotatably mounted gear,

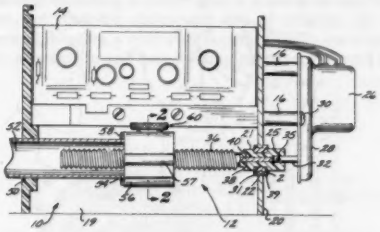
at least one further synchronizer on each of said lay shafts for selectively engaging said respective lay shaft with a respective rotatably mounted lay shaft gear, and

all forward gears synchronized by synchronizers.

4,106,359
ANTIFRICTION ASSEMBLIES

Denis G. Wolfe, Santa Ana, and Richard J. Berryhill, Fullerton, both of Calif., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Aug. 21, 1975, Ser. No. 606,484
Int. Cl.[2] F16H *1/18*
U.S. Cl. 74—424.8 R **18 Claims**



1. An antifriction assembly comprising:

(a) an elongated screw member having external helical threads;

(b) an annular nut member having internal helical threads of the same pitch and diameter as said external helical threads and threadably engaged on said screw member; and

(c) said external and internal helical threads having distinctively different flank angles to provide a minimal surface area of thread engagement and maximum surface loading;

said members being formed with engagement surfaces of plastics characterized by a coefficient of friction that is inversely dependent upon compressive loading.

4,106,360
INDEXED AND COWORKING GEARS

Albert Manna, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 30, 1977, Ser. No. 782,666
Int. Cl.[2] F16H *55/18;* B21D *53/28*
U.S. Cl. 74—440 **17 Claims**

1. In an assembly having a first gear assembly including a first gear having a first plurality of teeth, and a coworking second gear fixedly coaxially adjacent said first gear and having a second plurality of teeth indexed relative to said first plurality of teeth, the improvement comprising

a second gear assembly including a third gear having a third plurality of teeth in meshed engagement with said first gear first plurality of teeth, and a fourth gear adjustably coaxially secured adjacent to said third gear and having a fourth plurality of teeth adjustably indexed relative to said third plurality of teeth to have accurate meshed engagement with said second gear second plurality of teeth.

4,106,361

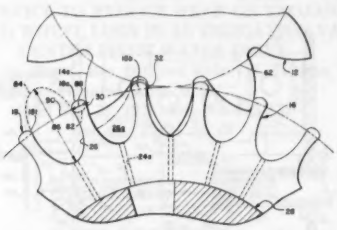
GEAR PUMP, GEAR AND METHOD

Wilson A. Burtis, Westminster, Calif., assignor to Wyle Laboratories, El Segundo, Calif.

Filed Oct. 26, 1976, Ser. No. 735,324

Int. Cl.[2] F16H *55/06, 1/28;* **B23F** *9/04*

U.S. Cl. 74—462 **7 Claims**



1. Gear apparatus comprising:

a gear having a plurality of teeth, each tooth having a shape identical to the shape of a cylinder-developed gear produced by first shaping a gear blank on a gear shaper, using as a cutter a first gear having teeth with the tips thereof forming at least 180° of a cylinder to form the cylinder-developed gear.

4,106,362

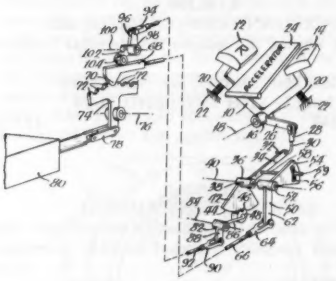
CONTROL LINKAGE FOR TORQUE CONVERTER TRANSMISSION OR THE LIKE

Harold V. Hildebrecht, Cleveland, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Filed Feb. 14, 1977, Ser. No. 768,119

Int. Cl.[2] G05G *1/14, 7/06*

U.S. Cl. 74—474 **10 Claims**



1. A control linkage comprising:

an actuator mounted for movement between first and second extreme positions and an intermediate position between said extreme positions;

means for restoring said actuator to said intermediate position from either extreme position upon the release of said actuator by an operator thereof;

a multiple-toothed member adapted to be connected to a mechanism to be controlled by said linkage;

means mounting said toothed member for shifting movement between at least three positions;

an element having a rounded nose and mounted for selective engagement with the teeth on said toothed member to shift said member between said three positions;

said teeth and said nose being constructed and arranged so that said nose may be cammed out of effective engagement with said teeth upon relative movement between said element and said member; and

means, including a linkage, interconnecting said actuator and said element for (a) moving said nose in opposite directions when said actuator is moved to or from its intermediate positions from or to its extreme positions, and (b) positively engaging said nose and said teeth when said actuator is moved from its intermediate position to either of its extreme positions and allowing said nose to be cammed out of effective engagement with said teeth when said actuator is moved from either of its extreme positions to its intermediate position.

4,106,363

ANTI-ROLL RACK BAR

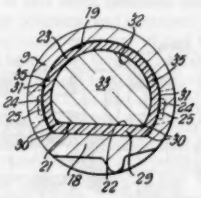
James Ernest Buckingham, Bristol, England, assignor to Cam Gears Limited, England

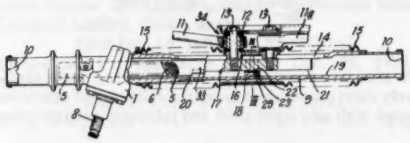
Filed Jun. 25, 1976, Ser. No. 699,720

Claims priority, application United Kingdom, Jul. 7, 1975, 28508/75

Int. Cl.[2] B02D *1/20*

U.S. Cl. 74—498 **14 Claims**





1. A center take-off rack and pinion vehicle steering assembly including a housing part, a rack bar part and a transmission bar part coaxial with said rack bar part, said rack bar part and said transmission bar part being disposed and axially slidable in said housing, steering linkage connected to said transmission bar part operable to effect vehicle steering upon axial movement of said transmission bar part, laterally extending pin means for connecting said steering linkage to said transmission bar part, a pinion coacting with the rack on said rack bar part and first means coacting between the housing and the rack bar part for urging said rack into contact with said pinion, means for rotating said pinion to effect axial movement of the transmission bar part and second means coacting between the housing and the transmission bar part including a separate bearing bush having side portions which at least straddle the transmission bar part and an intermediate portion which is located between the transmission bar part and said housing part, the bearing bush being fixed relative to either of said housing or transmission bar parts and slidable relative to the other part, said intermediate portion of the bearing bush carrying a flat face which opposes and is substantially in face-to-face contact with a second flat face carried on the transmission bar part and relative to which the bearing bush is slidable, said flat faces co-operating to resist turning movement of the transmission bar part and rack bar in the housing part.

4,106,364
VARIABLE GEAR TRANSMISSION

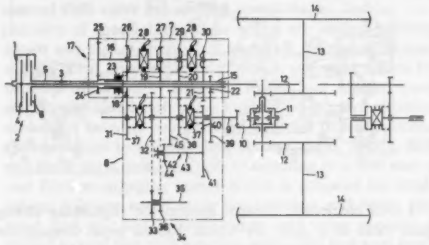
Walter Zenker, Bensberg-Refrath, and Karl-Heinz Hülsebusch, Cologne, both of Fed. Rep. of Germany, assignors to Klockner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed Apr. 5, 1976, Ser. No. 673,372

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1975, 2514781

Int. Cl.[2] F16H *37/02*

U.S. Cl. 74—740 **5 Claims**



1. A gear change transmission of the group type, especially for motor vehicles for agriculture and construction work, which includes in combination: an input shaft, a speed control transmission drivingly connected to said input shaft, a group transmission drivingly connected to and following said speed control transmission, a main shaft common to said group trnsmission and said speed control transmission, said group transmission having an output shaft journalled parallel to said main shaft, said main shaft being coaxially mounted with said input shaft, a first group of gears connected to said main shaft for rotation therewith, a counter shaft forming part of said speed control transmission and being arranged parallel to said main shaft for driving the gears of said first group of gears, inlet transmission means drivingly connecting said counter shaft to said input shaft, clutch means operable to drivingly connect said input shaft to said main shaft, a second group of gears freely rotatably mounted on said counter shaft and comprising a first and second pair of gears, a third group of gears freely rotatably mounted on said output shaft and comprising a third and fourth pair of gears, all gears of said first group of gears being drivingly connected to said second and third group of gears, first and second double shift means axially displaceable on and connected to said counter shaft for rotation in common therewith and respectively operatively associated with said first and second pair of gears of said second group of gears, third and fourth double shift means axially displaceable on and connected to said output shaft and respectively operatively associated with said third and fourth pairs of gears of said third group of gears, and a reversing transmission including a gear meshing with one of the gears of said third group of gears, said first and second double shift means being provided with synchronizing elements, and said third and fourth double shift means and said first and second double shift means having like annular grooves for shift forks of the same wrench width.

4,106,365
POWER TRAIN ARRANGEMENT FOR SURFACE-HANDLING VEHICLE

Koji Nozawa, and Motoichi Ohba, both of Tokyo, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Apr. 5, 1977, Ser. No. 784,721

Claims priority, application Japan, Apr. 6, 1976, 51-43097[U]

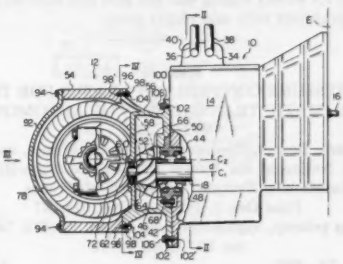
Int. Cl.[2] F16H *37/00*

U.S. Cl. 74—740 **5 Claims**

1. A power train arrangement of a powered surface-handling vehicle, comprising

a power transmission mechanism including a transmission output shaft and a transmission casing having a vertical wall portion, and

a differential reduction gear unit including a drive gear connected to said transmission output shaft and rotatable about a fixed center axis substantially normal to said wall portion, an axle housing accommodating therewithin a differential gear assembly rotatable in its entirety about an axis of rotation non-intersecting said center axis, said gear assembly including a driven gear in mesh with said drive gear and rotatable about said axis of rotation, an axle carrier including a first wall portion fixedly but detachably attached to said axle housing and a second wall portion having an axis substantially in line with said center axis of said drive gear and an outer contour symmetrical with respect to said axis thereof, and a plurality of fastening elements fixedly but detachably connecting said second wall portion to said wall portion of said transmission casing and arranged substantially symmetrically with respect to said axis of said second wall portion, said axle carrier being reversible in vertical position relative to said transmission casing and said differential gear assembly being reversible in the axial direction thereof for having said axis of rotation located on a plane parallel with and higher or lower by a predetermined distance than said center axis of said drive gear.



4,106,366
PLANETARY GEAR

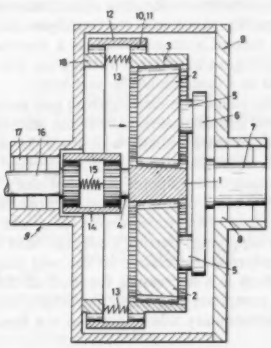
Karlheinz Altenbokum; Rolf Goldschmidt; Klaus Hansgen, all of Witten; Heinz M. Hiersig, Dusseldorf, and Peter Szynka, Witten, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Nov. 26, 1976, Ser. No. 745,431

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1975, 2558093

Int. Cl.[2] F16H *1/28, 57/00*

U.S. Cl. 74—801 **5 Claims**



1. A planetary drive comprising:

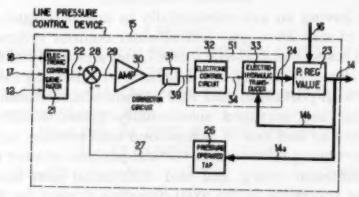
a sun gear;
an internal gear;
at least two planet gears having teeth and being in engagement with said sun gear and said internal gear, said sun gear and said internal gears are axially movable with respect to the planet gears;
a planet link connecting said planet gears; at least one of said sun gear, said planet link, and said internal gear being radially movable for equalizing the load; said sun gear, said internal gear and said planet gears having beveled spur gear teeth, with the bevel of said sun gear and of said internal gears matching the bevel of said planet gears; and
means for axially urging said sun gear and internal gear into engagement with said planet gears.

4,106,367

PRESSURE CONTROL APPARATUS FOR THE AUTOMATIC TRANSMISSION OF AUTOMOTIVE VEHICLES

Jean-Marie Bouvet, Boulogne-Billancourt, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt and Automobiles Peugeot, Paris, both of, France

Filed Oct. 3, 1975, Ser. No. 619,187
Claims priority, application France, Oct. 7, 1974, 74 33669
Int. Cl.[2] B60K *41/18*
U.S. Cl. 74—866 **13 Claims**



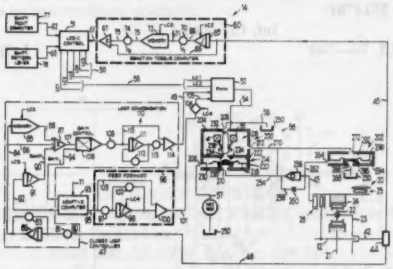
1. Apparatus for controlling the supply pressure of the control members of an automatic transmission for vehicle power units, said apparatus comprising a control generator element supplying an electrical command voltage which is directly proportional to said supply pressure as a function of electrical signals representing information relative to the functioning of said transmission and of the vehicle power unit, said information comprising the state of the transmission, whether in engagement or between engagements due to inherent circuit delay, the ratio engaged or about to be engaged, the rotational speed of a transmission member, and the load of the vehicle power unit, said apparatus comprising in combination therewith:
first means for supplying a first voltage which is a decreasing linear function of the said rotational speed and whose gradient is a function of the state of the transmission ratio,
second means for supplying, starting from the said first voltage, a second voltage which is a decreasing linear function analogous to said first voltage but whose position is displaced as a function of the said load,
third means for supplying, starting from said second voltage and from the information relative to the state of the transmission ratio, a third voltage which is a decreasing function of the rotational speed and comprises two linear portions connected by a point of discontinuity, the respective gradients of each of said linear portions being a function of the state of the transmission ratio, and
fourth means supplying, starting from said third voltage and from the information relative to the said load, a fourth voltage which is a decreasing function of the rotational speed and comprises two linear portions connected by a point of discontinuity whose position is a function of the load,
said control generator element being responsive to said four voltages for supplying said command voltage.

4,106,368

TRANSMISSION CONTROL SYSTEM

John Saxon Ivey, Bloomfield Hills, Mich., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 22, 1976, Ser. No. 753,329
Int. Cl.[2] B60K *41/18*
U.S. Cl. 74—866 **8 Claims**



1. An electronic control system for regulating change of gear ratio in a gear set which has an input connection for receiving drive from an engine and an output mechanical drive connection for supplying drive torque to a load, comprising an electronic control unit having an output connection coupled to the gear set to effect a change of gear ratio when the control unit supplies a change-gear signal and including a diaphragm valve having a variable position diaphragm;
a sensor, positioned adjacent the mechanical output driving connection of the gear set, for providing an output torque signal which varies as a function of the output drive torque provided by the gear set;
means, coupled between the sensor and the control unit, for supplying the output torque signal to the control unit in order that the control unit can control the change of gear ratio in response to the output torque signal; said diaphragm valve including a reciprocating piston member responsive to an electrical signal from said control unit to open and close fluid ports in said valve to control the position of said diaphragm to control the change of ratio, said transmission including a fluid actuated friction device for changing gear ratio, said friction device being connected to said diaphragm valve, said diaphragm valve having two fluid chambers separated by said diaphragm, said valve having an inlet port connected to said source of pressure and one of said chambers, said valve having an outlet pressure port in said one chamber connected to said friction device, and said valve including a fluid exhaust port and said piston being adapted to open said exhaust port when positioned to close said outlet port, said exhaust port being connected to said friction device and adapted to reduce the pressure therein when open.

4,106,369

OIL PRESSURE CONTROL SYSTEM FOR AN AUTOMATIC TRANSMISSION SYSTEM

Yutaka Taga, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Oct. 7, 1975, Ser. No. 620,269
Claims priority, application Japan, Dec. 23, 1974, 49-147901
Int. Cl.[2] B60K *21/00*
U.S. Cl. 74—869 **12 Claims**

2. An oil pressure control system for an automatic transmission system which includes a fluid torque converter, a transmission gear and friction engaging means for establishing a selected transmission engagement in said transmission gear, comprising:
a source of oil pressure;
a line pressure regulating valve which generates a line pressure from the oil pressure of said source, said line pressure

being regulated to be suitable for operating said friction engaging means;

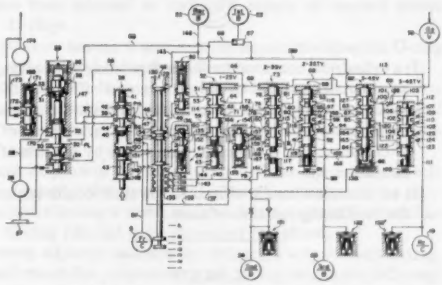
a throttle pressure regulating valve which generates a throttle pressure from said line pressure, said throttle pressure increasing as the engine torque increases;

a governor pressure regulating valve which generates a governor pressure from said line pressure, said governor pressure increasing as the vehicle speed increases;

a throttle pressure modulating valve which generates a throttle modulated pressure from said throttle pressure, said throttle modulated pressure being lower than said throttle pressure by a determined amount;

a manual shift valve for shifting speed ranges; and

a plurality of speed shift valves which are shifted between lower and higher speed shift positions for changing over supply of oil pressure to said friction engaging means for shifting transmission between lower and higher speed stages, said speed shift valve comprising a valve member, said valve member being shifted between first and second shift positions to control first, second, third, fourth, fifth and sixth ports, said first port connecting to a first one of said friction engaging means which is actuated for establishing a lower speed stage transmission and being supplied with the line pressure when said valve member is shifted to said first shift position while said first port being isolated from supply of the line pressure and connected to said second port when said valve member is shifted to said second shift position, said second port connecting to a



drain passage, said third port connecting to a second one of said friction engaging means and being supplied with the line pressure when said valve member is shifted to said second shift position while said third port being isolated from supply of the line pressure and connected to said fourth port when said valve member is shifted to said first shift position, said fourth port connecting to a drain passage, said valve member comprising first and second land portions presenting first and second end faces oppositely arranged as exposed to a common chamber, said first end face being larger than said second end face, said first land portion controlling said fifth port in a manner to open said port toward said common chamber when said valve member is shifted to said first shift position while said first land portion isolating said fifth port from said chamber when said valve member is shifted to said second shift position, said second land portion controlling said sixth port in a manner to open said port toward said common chamber when said valve member is shifted to said second shift position while said second land portion isolating said sixth port from said chamber when said valve member is shifted to said first shift position, said first end face of said first land portion being applied with a force from pressure existing in said common chamber, said force acting in a first direction to urge said valve member toward said first shift position, said fifth port being supplied with said throttle pressure while said sixth port being supplied with said throttle modulated pressure, said valve member further being applied with said governor pressure at its one end, said governor pressure driving said valve member in a second direction opposite to said first direction.

4,106,370

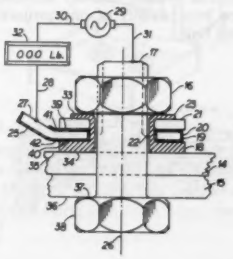
ELECTRIC INFINITE-RANGE LOAD-SENSING TRANSDUCER

Robert August Kraus, and Edmund Joseph Kraus, both of 14160 Redhill #39, Tustin, Calif. 92680

Filed Feb. 9, 1977, Ser. No. 767,138

Int. Cl.[2] F16B *31/02*

U.S. Cl. 73—88 F **6 Claims**



1. An infinite-range compressive load-sensing and measuring device, comprising a first flat, metallic, electrically conductive member, having at least one electrically conductive side surface;

and further comprising a second, flat, metallic, electrically conductive aluminum member having an electrically insulating surface material on each of its opposing sides;

said first and said second electrically conductive members each having means for connecting the terminal of an electric current carrying wire thereto;

an electrically conductive side surface of said first member and at least one of said second member's electrically insulated surfaces being in a full solid abutting contact with each other; thus, said first and second member in combination form a compressive load-responsive assembly;

wherein the electrically insulating material of said second member is the oxide of aluminum, being ongrown thereto to a predetermined thickness, utilizing the process of electrolytic conversion;

and wherein, upon the supply of an electric current to said first and said second electrically conductive members the application of an opposing light to severe compressive load to the flat outer surfaces of said first and said second members causes a minute, but electronically detectable, change in the electric current-leakage across the electrically insulating material of the second member;

which minute change in the electric current-leakage may be electronically detected, measured and displayed.

4,106,371

CLAMPING TOOL

Toshio Akiyoshi; Tsutomu Onishi, both of Fukuoka, and Shozo Haikawa, Kyoto, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo and Kabushiki Kaisha Terauchi Seisakusho, Kyoto, both of, Japan

Division of Ser. No. 683,874, May 6, 1976, which is a continuation of Ser. No. 450,921, Mar. 13, 1974, abandoned. This application Feb. 17, 1977, Ser. No. 769,806

Int. Cl.[2] B25B *29/00*

U.S. Cl. 81—57.14 **8 Claims**

1. A power wrench comprising:

a case,

a harmonic drive mechanism,

at least one planetary gear device incorporated in said case and connected to said harmonic drive mechanism for

reducing the output speed of said harmonic drive mechanism,

a first mechanism driven by said at least one planetary gear device and rotating a nut screwable on a torque set bolt,

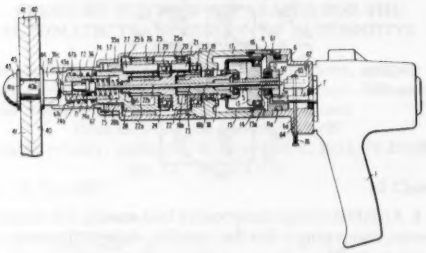
a second mechanism driven by said at least one planetary gear device engaging a projection portion of said torque set bolt and rotating said projection portion,

said second mechanism including a fitting portion fitting to the projection portion of said torque set bolt,

said first mechanism having a cylindrical portion fitted to said nut,

said second mechanism fitting portion comprising a cylindrical bore,

a cylindrical inertia weight slidably mounted within said fitting portion bore, axially of said projection portion of said torque set bolt,



means for spring biasing said inertia weight into contact with said projection portion of said torque set bolt when received by said second mechanism fitting portion, with said projection portion axially shifting said inertia weight within said bore and compressing said biasing means,

a rod fixed to and extending axially from said inertia weight in a direction away from said torque set bolt, and

a displaceable engaging member engagable with the end of said rod remote from said inertia weight to releasably latch said rod with said inertia weight axially displaced under spring compression and in abutment with the projection portion of said torque set bolt prior to torquing of said set bolt and severance of the smaller diameter portion of said torque set bolt due to the rotation of said projection portion.

4,106,372

ADJUSTABLE END WRENCH

Jerold R. Miller, Porterville, Calif., assignor to Robert A. Dexter, Porterville, Calif., a part interest

Filed Apr. 12, 1977, Ser. No. 786,941
Int. Cl.[2] B25B *13/14*
U.S. Cl. 81—143 **1 Claim**

1. An adjustable wrench, comprising, in combination:

(a) a frame provided with a fixed jaw;

(b) a movable jaw mounted on the frame for movement toward and away from the fixed jaw; and

(c) lock means mounted on the frame for selectively restraining the movable jaw from movement relative to the frame and fixed jaw, the lock means including, in combination:

(1) a projection provided on the movable jaw;

(2) a latch provided with a protrusion arranged for selective engagement with the projection of the movable jaw, and

(3) actuator means mounted on the frame for moving the protrusion provided on the latch toward and away from the movable jaw and selectively engaging the protrusion with the projection in order to restrain the movable jaw from movement, the actuator means including, in combination:

(4) the latch being provided with a through opening, with the movable jaw being provided with a plurality of projections in the form of teeth, and the latch being provided with a plurality of protrusions also in the form of teeth mating with the teeth of the movable jaw so that the teeth of the latch can selectively engage with the teeth of the movable jaw, the frame forming a manipulating handle and being provided with a groove arranged extending away from the fixed jaw, the movable jaw being provided with a tongue slidably engaged in the groove, the frame also being provided with a through recess communicating with the groove provided in the frame, and the latch being slidably disposed in the recess;

(5) a cylindrical eccentric having a depending shaft arranged substantially parallel to the groove and off center of the eccentric and journaled on the frame, with the eccentric conforming with and being arranged in the opening of the latch for moving the latch by cam action by rotation of the eccentric; and

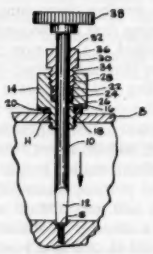
(6) an actuation handle affixed to the shaft of the eccentric for facilitating rotation of same.

4,106,373

BIT DRIVING TOOL FOR USE IN BARRIERS SEPARATING DIFFERENT ENVIRONMENTS

George Trongo, 2974 Flannery Rd., San Pablo, Calif. 94806

Filed Jun. 15, 1977, Ser. No. 806,619
Int. Cl.[2] B25B *23/00*
U.S. Cl. 81—180 R **5 Claims**



1. A self-supporting tool for removable use in broach holes of barriers separating different environments comprising,

an elongated sleeve having first and second spaced apart ends defining a shaft guide hole therethrough with an annular recess in said sleeve, said first sleeve end having a means of removable attachment to a barrier broach hole,

a shaft having a driving and a driven end, said shaft being positioned through the shaft guide hole in a slidable, rotat-

able relation therewith, said shaft having a length greater than the length of said sleeve for operating in said broach hole beyond said sleeve,

sealing material disposed in said annular recess of said sleeve for sealing said shaft guide hole between said shaft and said sleeve.

4,106,374

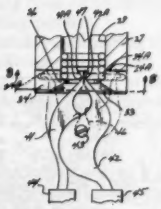
ORTHODONTIC O-RING DISPENSER AND LIGATOR THEREFOR

William B. Dragan, R.F.D. #1 Burr St., Fairfield, Conn. 06430

Continuation-in-part of Ser. No. 423,420, Dec. 10, 1973, abandoned. This application Nov. 14, 1975, Ser. No. 631,920

Int. Cl.[2] B25B *7/12*

U.S. Cl. 81—302 **9 Claims**



1. An orthodontic O-ring dispenser comprising:

a housing having a bore extending therethrough,

said bore adapted to contain a supply of stacked elastic O-rings,

said bore having a diameter for accommodating an O-ring adapted to be dispensed therefrom,

said housing having a rigid non-expandible end portion terminating in a dispensing opening formed at one end of said housing, said opening being in communication with said bore,

said dispensing opening being defined by a transversely extending slot formed in said end portion,

said slot having a width which is less than the diameter of an O-ring adapted to be dispensed therefrom,

means adjacent said slot for defining a stop for said O-ring,

and means for progressively advancing said stacked O-rings toward said stop means as the endmost O-ring is dispensed by causing said endmost O-ring to be stretched to and form a flat oval permitting it to be removed through said rigid slot.

4,106,375

VARIABLE FEED HIGH-PRODUCTION PRECISION MACHINE

Felix J. Gurdak, Winsted, and Francis W. Cook, Jr., Newington, both of Conn., assignors to Litton Industrial Products, Inc., New Britain, Conn.

Filed Apr. 18, 1975, Ser. No. 569,543

Int. Cl.[2] B23B *3/32*

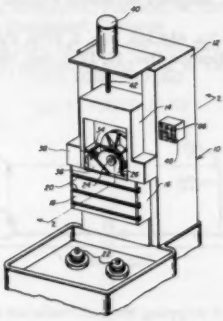
U.S. Cl. 82—21 B **6 Claims**

1. In a machine tool having movable slides for moving a slide mounted tool holder through a tool path relative to a rotating workpiece to machine said workpiece to a desired form,

means to drive said slides comprising rotatable slide driving cams having profiles defining said tool path coordinates whereby in each revolution of said cams said workpiece will be machined to said desired form, said workpiece form having portions that cam be machined at faster rates than other portions,

a variable speed motor for rotating said driving cams at a plurality of speeds providing optimum feed rates for each portion of the workpiece form to be machined in each revolution of said cams,

means for establishing voltages corresponding to speeds providing optimum machining rates for each portion of said workpiece, and



means for applying said voltages to vary the speed of said motor in each revolution of said driving cams thereby to vary the feed rate of said tool holder according to the portion of the workpiece form being machined.

4,106,376

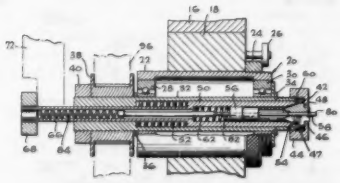
REPLACEABLE ROTATING WORKPIECE SPINDLE WITH NORMALLY CLOSED COLLET

Edgar P. Freer, 7000 Scarborough Peak Dr., Canoga Park, Calif. 91307

Filed Apr. 19, 1976, Ser. No. 678,221

Int. Cl.[2] B23B *19/02, 19/00*

U.S. Cl. 82—30 **7 Claims**



1. A spindle assembly for mounting in a spindle carrier for adjustment with respect to the front wall of the spindle carrier, said spindle assembly comprising:

a spindle housing, said spindle housing having an external surface for mounting in an opening in the spindle carrier;

a spindle mounted for rotation on a spindle axis in said spindle housing, said mounting being such that said spindle is axially rigid with respect to said spindle housing;

an adjustment ring threaded on said spindle housing and extending outwardly from said external surface on said spindle housing so that said adjustment ring can lie against the front wall of the spindle carrier and be clamped with respect thereto and said spindle housing can be adjusted in a direction along said axis with respect to said wall by rotation of said adjustment ring on its threads on said housing.

4,106,377

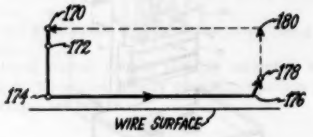
METHOD FOR STRIPPING INSULATION FROM WIRE

William S. Owen, Jr., Lenox, and George C. Lovejoy, Pittsfield, both of Mass., assignors to General Electric Company, Philadelphia, Pa.

Division of Ser. No. 654,365, Feb. 2, 1976, Pat. No. 4,067,250. This application Dec. 27, 1976, Ser. No. 754,270

Int. Cl.² H02G 1/12

U.S. Cl. 83—4 **6 Claims**



1. A method of stripping bonded insulation from an insulated metal wire of generally rectangular cross-section comprising the steps of:

(a) engaging the insulation of the wire with the edge of a knife,

(b) penetrating said insulation and said metal forming the wire with said knife edge by moving said knife edge in a substantially orthogonal direction through said insulation into said metal,

(c) then moving said knife edge through a predetermined stroke in a longitudinal direction along the length of said wire while maintaining said edge in the metal of the wire during substantially said entire stroke to thereby remove from the wire a composite chip including a length of said insulation substantially equal to said stroke and a sliver of said metal of substantially the same length.

4,106,378

APPARATUS FOR AVOIDING PLAY IN THE DRIVE OF A CIRCULAR SAW

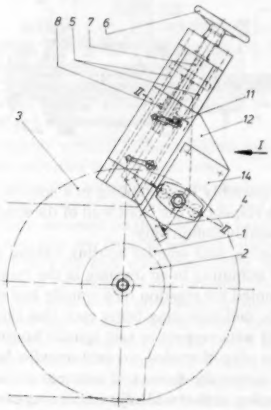
Gerhard Kaiser, Metzingen, Fed. Rep. of Germany, assignor to Gustav Wagner Maschinenfabrik, Reutlingen, Fed. Rep. of Germany

Filed Sep. 12, 1977, Ser. No. 832,747

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1976, 2641465

Int. Cl.² B23D 45/00

U.S. Cl. 83—74 **10 Claims**



1. An apparatus for avoiding play in the drive mechanism of a circular saw, including electric motor means for operating a circular saw blade, comprising brake means, support means supporting said brake means for cooperation with said circular saw blade, power operating means operatively connected to said brake means, sensing means connected to sense the operating status of said circular saw blade, and control means operatively associated with said power operating means and to said sensing means for operating said brake means in response to the instantaneous operating status of said saw blade.

4,106,379

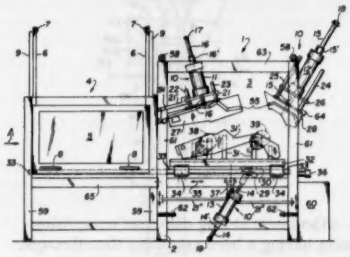
APPARATUS FOR TRIMMING THREE-DIMENSIONAL WORKPIECES

Ernst Maximilian Spengler, Heusenstamm, Germany, assignor to Stanztechnik GmbH R & S, Frankfurt, Germany

Filed Jun. 24, 1977, Ser. No. 809,921

Int. Cl.² B26D 5/12, 5/42, 7/02, 11/00

U.S. Cl. 83—171 **22 Claims**



1. An apparatus for trimming randomly, three-dimensionally shaped workpieces having an inside and an outside, comprising frame means, workpiece support means mounted in said frame means for holding said workpiece on the outside of the workpiece, counter-holder means mounted in said frame means for contacting the workpiece on the inside and for holding a three-diimensional workpiece against said workpiece support means, tool carrier means mounted in said frame means, strip steel knife means operatively secured to said tool carrier means, power drive means operatively connected to said tool carrier means for moving said strip steel knife means toward and away from said workpiece, said strip steel knife means having a configuration corresponding to workpiece edges to be trimmed, said apparatus further comprising mounting means for securing said tool carrier means to said frame means in different angular positions, whereby said strip steel knife means which are secured to said tool carrier means, are movable in a direction determined by the angular position of the respective tool carrier means, said workpiece support means having openings therein for the strip steel knife means to pass through said openings whereby, the combination of all individual knife movements provides a three-dimensional cutting.

4,106,380

ANGLE IRON CUTTING

James Henry Stubbings, Rockville, Md., assignor to Potomac Applied Mechanics, Inc., Bethesda, Md.

Filed May 9, 1977, Ser. No. 795,088

Int. Cl.² B26D 9/00, 7/06

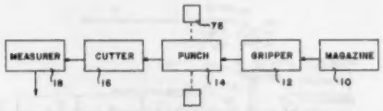
U.S. Cl. 83—212 **14 Claims**

1. Apparatus for automatic punching and cutting of angle irons or the like comprising:

means for providing a supply of angle irons to be cut comprising means for vertically stacking a plurality of angle irons and means for feeding the angle irons one at a time to the transporting means from the top of the stack, said stacking means comprising a magazine, and further comprising means for pivotally mounting said magazine so that it may be moved to a generally horizontal position in which said magazine may be loaded with angle irons, and

then moved to the position in which the angle irons are vertically stacked; means for upwardly biasing the angle irons in said stack so that upon removal of one angle iron from the top of the stack, the next angle iron assumes the position previously taken by the removed angle iron,

means for transporting said angle irons away from said supply supply means;



means for punching holes of predetermined size in an angle iron at a punching position;

means for automatically determining the length of angle iron to be cut at a cutting position; and

means for cutting an angle iron at the cutting position to provide an angle iron of predetermined length.

4,106,381

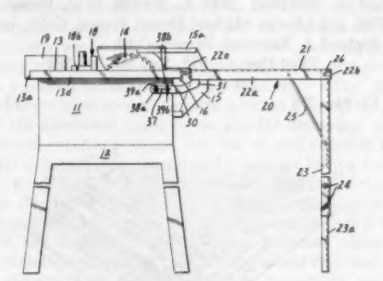
EXTENSION TABLE FOR TABLE SAWS

Lloyd D. Kreitz, P.O. Box 60, Pequot Lakes, Minn. 56472

Filed Aug. 15, 1977, Ser. No. 824,913

Int. Cl.² B27B *5/22*

U.S. Cl. 83—477.2 **12 Claims**



1. In combination with a power saw assembly which comprises a saw housing supported a desired distance above the floor; mounted above said housing a generally rectangular horizontal worktable having a feed end, a discharge end, right and left sides, and peripherally depending lips; said worktable having a centrally located elongate opening to accommodate a rotary saw blade; at least one groove located in the top of said worktable extending parallel to both sides and shaped to accommodate a miter gauge rod; located at the ends of said worktable, means for positioning a rip fence parallel to said sides; a rotary saw blade positioned within said housing beneath said worktable and movable through said opening; means for rotating said blade; positioned beneath said worktable and extending beyond the discharge end, a support; and a saw guard hingedly connected to said support;

a generally rectangular, flat-topped extension table comprising an elongate flat panel having two sides, a distal end, and a proximal end, lips depending from said sides and ends to enhance rigidity;

support means connected to the distal portion of said extension table to position said distal end a predetermined distance above the floor, said distance corresponding to the height of the worktable above the floor;

first means attaching the proximal lip adjacent one side of said extension table to the lip at the discharge end of said worktable, thereby aligning the upper surfaces of said tables; and

second means attaching the proximal lip adjacent the other side of said extension table to said saw housing.

4,106,382

CIRCULAR SAW TOOL

Ernst Saljé, Schulheide 4, D 2106 Bendestorf, Germany, and Ulrich Bartsch, Brunswick, Fed. Rep. of Germany, assignors to Ernst Saljé, Bendestorf, Germany

Filed May 24, 1977, Ser. No. 800,049

Claims priority, application Fed. Rep. of Germany, May 25, 1976, 2623339

Int. Cl.² B27B *33/08*

U.S. Cl. 83—835 **6 Claims**

1. A circular saw tool, with a single-ply or multi-ply disc-shaped saw blade and teeth distributed over the circumference thereof, the saw blade being provided on each side with a covering having the shape of a thin round blank and an intermediate layer consisting of an adhesive having a high degree of elasticity which connects the covering to the blade, said coverings together with said layers of adhesive providing a noise suppression system as well as an encapsulation on both sides of the saw blade for reducing noise radiated by the saw blade.

4,106,383

REGISTER ARRANGEMENT FOR AN ELECTRONIC MUSICAL INSTRUMENT

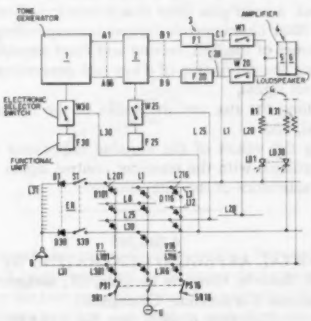
Wilfried Dittmar, Halsenbach, Fed. Rep. of Germany, assignor to WERSI-electronic GmbH & Co. Kommanditgesellschaft, Halsenbach, Fed. Rep. of Germany

Filed Dec. 6, 1976, Ser. No. 747,735

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1975, 2555083

Int. Cl.² G10H *1/02, 5/00*

U.S. Cl. 84—1.01 **17 Claims**



1. In an electronic musical instrument, the combination of

(a) a tone generator (1) adapted to produce tone signals;

(b) means (2) for selecting said tone signals;

(c) functional units (F1–F30) for influencing said tone signals;

(d) a discrete electronic selector switch (W1–W30) in controlling relationship with each of said functional units;

(e) a discrete control conductor (L1–L30) in controlling relationship with each of said selector switches;

(f) an individual register assembly (ER) having first actuat-

ing elements (S1–S30) each operatively connected to one of said control conductors to apply control voltage (from L31) thereto; and

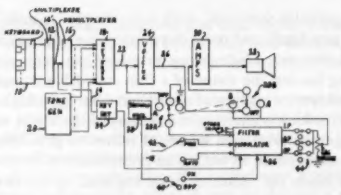
(g) a plurality of collecting register assemblies (SR1–SR16) each having a second actuating element (PS1–PS16 or PSU1–PSU16) and an associated distributor circuit (V1–V16), each of said distributor circuits being connected to a different combination of control conductors and being energizable by the respective second actuating element to apply control voltage simultaneously to the corresponding combination of selector switches.

4,106,384

VARIABLE FILTER CIRCUIT, ESPECIALLY FOR SYNTHESIZING AND SHAPING TONE SIGNALS

Billy J. Whittington; John William Robinson, and Ralph N. Dietrich, all of Jasper, Ind., assignors to Kimball International, Inc., Jasper, Ind.

Filed May 21, 1976, Ser. No. 688,565
Int. Cl.[2] G10H *1/04, 5/00*
U.S. Cl. 84—1.19 **20 Claims**



1. The method of producing special sound effects in an electronic organ having a tone generator, an output circuit including an acoustic transducer, and playing keys with each key when depressed controlling the supply of a respective tone signal from the generator to the output circuit, said method comprising:

interposing a filter circuit comprising a first amplifier, a second amplifier and a third amplifier connected in series in the order named and connected between the tone generator and output circuit,

interposing a variable impedance element in the inputs to each of the second and third amplifiers,

said filter circuit having a high pass filter characteristic output, a band pass filter characteristic output and a low pass filter characteristic output corresponding to respective ones of the first, second and third amplifiers,

detecting the depression of a key and generating a transient control signal,

controlling the rise and the decay of the transient control signal, and

varying the values of the variable impedance elements in accordance with the transient control signal to vary the characteristics of the filter circuit.

4,106,385

DIGITAL ARPEGGIO GENERATING DEVICE

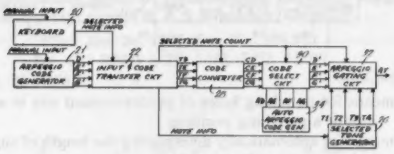
Patrick S. Roberts, Glendale Heights, Ill., assignor to Thomas International Corporation, Chicago, Ill.

Filed Oct. 6, 1975, Ser. No. 619,810
Int. Cl.[2] G10H *3/06;* **G10F** *1/00;* **G10H** *1/02*
U.S. Cl. 84—1.24 **20 Claims**

1. In a musical instrument having tone signal generating means, a first set of controls for selecting tone signals and means for sequentially producing tone signals having predetermined frequency relationships with the selected tone signals, the improvement comprising:

a second set of serially arranged individually actuable switches smaller in number than said first set of controls and manually actuable for generating a series of individually identifiable control signals; means associated with said second set of switches for preventing generation of more than one control signal at a time;

means connected with said second set of switches and said tone signal generating means for associating a selected tone signal with each of said control signals; and



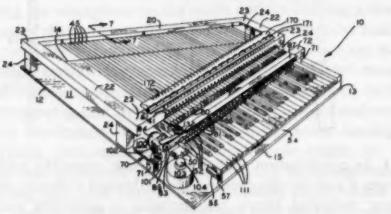
means responsive to generation of each control signal and its associated selected tone signal for generating output tone signals having predetermined frequency relationships with said selected tone signals.

4,106,386

MUSICAL STRINGED INSTRUMENT

Richard A. Rotramel, 2525 E. Peralta Way, Fresno, Calif. 93703, and Charles Michael Fisher, Fresno, Calif., assignors to Richard A. Rotramel, Fresno, Calif.

Filed Dec. 6, 1976, Ser. No. 747,500
Int. Cl.[2] G10C *1/00*
U.S. Cl. 84—256 **17 Claims**



1. A musical instrument comprising:

(A) a vibratory string;

(B) a resiliently flexible filament having a mounting end and an opposite tip adapted to engage the string for inducing vibrations thereof;

(C) means mounting the filament for movement in an orbital path in which the filament periodically engages the string and in which the tip passes substantially through the position occupied by the string when the string is at rest;

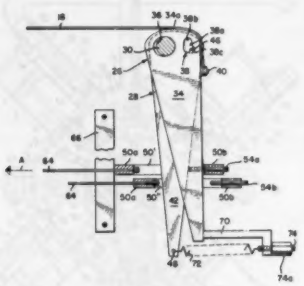
(D) powered means for rotating the filament in said orbital path; and

(E) manually controlled means for moving said path relative to the string for selective engagement with and disengagement from the string by the filament, in which the mounting means includes a shaft having a portion adjacent to the string on which the filament is mounted; and the means for moving said path is a key mechanism having a support portion provided with a bearing receiving said shaft for rotational movement about an axis substantially parallel to the string, a finger portion, and a pivot portion connected to the support portion for pivotal movement of the support portion towards and from the string in response, respectively, to depression and release of the finger portion.

4,106,387
STRINGED MUSICAL INSTRUMENT

Arthur William Alifano, P.O. Box 467, West Sand Lake, N.Y. 12196

Filed Mar. 19, 1976, Ser. No. 668,553
Int. Cl.[2] G10D *3/14*
U.S. Cl. 84—312 P **7 Claims**



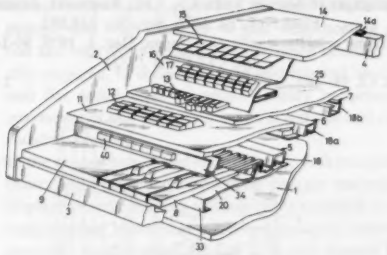
1. A stringed musical instrument including:
a means supporting thereon a plurality of strings,
a plurality of tuning keys each having one end of a corresponding string attached thereto for controllably tensioning said strings to a basic normally tuned condition corresponding to a predetermined nominal tone,
tone changing means connected to the other end of each string including a shaft and a pair of operable members pivotally supported on said shaft and each capable of being rotated about said shaft from a normal first position to a second variable position, actuation of either of said members to its second variable position altering the pitch of the associated string by an amount dependent on the second variable position, the first of said operable members comprising an elongated flat member having an arcuate head, an oblong hole, and an eccentric cam slot means the other end of each of said strings being operatively connected to the upper end of a corresponding first member, the second of said operable members comprising substantially the same configuration as said first lever with a circular hole and an extending controlling pin, said oblong hole of said first lever being aligned with said circular hole of said second lever, said controlling pin registering within said eccentric cam slot means,
a plurality of pedals and means for coupling any one of said pedals to either of said operable members for any said string to selectively change the pitch of any string by an amount dependent on which pedal is actuated,
and means responsive to the concurrent actuation of a pair of pedals coupled respectively to both said operable members associated with any string to produce a third change of pitch of said string which is different from the amount of pitch change occuring in response to actuation of either of said pair of pedals alone.

4,106,388
KEYBOARD UNIT FOR ELECTRONIC MUSICAL INSTRUMENTS

Reinhard Franz, Halsenbach, Fed. Rep. of Germany, assignor to WERSI-electronic GmbH & Co. Kommanditgesellschaft, Halsenbach, Fed. Rep. of Germany

Filed Mar. 9, 1977, Ser. No. 775,932
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1976, 2610318
Int. Cl.[2] G10C *3/04, 3/12*
U.S. Cl. 84—434 **16 Claims**

1. In a musical instrument, a keyboard unit comprising a housing having a bed and spaced-apart first and second side walls extending upwardly from said bed; substantially plate-like first and second bearing members provided in said housing adjacent the respective side walls; means for adjustably securing said bearing members to said housing; a plurality of carriers disposed between said bearing members and each including an elongated hollow profiled member having first and second end portions adjacent the respective bearing members and an elongated slot, at least one substantially plate-like support for keys, switches, stops, drawbars or analogous components, and

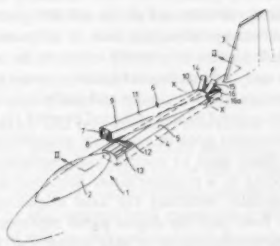


means for adjustably fastening said support to said profiled member including at least one externally threaded member extending through said support and the slot of said profiled member and an internally threaded member non-rotatably received in and slidable lengthwise of said profiled member and mating with said externally threaded member, the profiled members of said carriers being substantially parallel to each other; and means for pivotally securing the end portions of said profiled members to the respective bearing members.

4,106,389
AIRCRAFT WEAPON MOUNTINGS

Gerald David Walley, Preston, England, assignor to British Aircraft Corporation, London, England

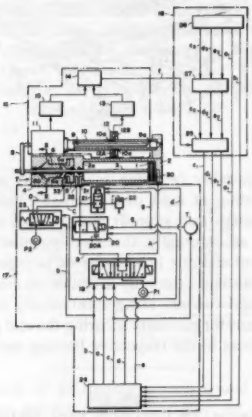
Filed May 10, 1977, Ser. No. 795,626
Claims priority, application United Kingdom, May 14, 1976, 20084/76
Int. Cl.[2] F41F *3/06*
U.S. Cl. 89—1.815 **7 Claims**



1. An aircraft having a fuselage with a forward cockpit region, an aft empennage region, an upper deck region extending between the two regions, a launcher assembly, for housing and launching at least one rocket propelled weapon, the launcher assembly being of elongated form with a forward end region through which the weapon is launched, a rearward end region through which rocket exhaust gases are dissipated, and an upper deck region extending between said end regions, a trough in the fuselage upper deck region formed to accommodate the launcher assembly in a stowed position such that its upper deck region lies smoothly continuously with the fuselage upper deck region, hinge means, and jack means, spaced from the hinge means, connecting the launcher assembly to the fuselage, the arrangement being such that the launcher assem-

bly can be moved from the stowed position to an extended position in which the weapon can be launched.

4,106,390
PNEUMATIC LINEAR ACTUATOR
Hiroshi Kodaira, and Mitsuo Masuda, both of Asahi, Japan, assignors to Kuroda Seiko Co., Ltd., Kawasaki, Japan
Filed Nov. 24, 1976, Ser. No. 744,592
Claims priority, application Japan, Dec. 1, 1975, 50-144101
Int. Cl.[2] F15B *15/26*
U.S. Cl. 91—42 **2 Claims**



1. A pneumatic linear actuator comprising a cylinder, a piston axially movable in said cylinder, a piston rod connected to said piston, mechanical braking means for mechanically engaging with said piston rod to mechanically brake said piston rod, displacement control means for automatically controlling sequential operation including pneumatically braking to decelerate said piston in the course of movement toward a predetermined stop position and then actuating said mechanical braking means to stop said piston and said piston rod at the predetermined stop position, a source of air pressure incorporated in said displacement control means to be connected to said cylinder and said mechanical braking means for supplying air under pressure to said cylinder and said mechanical braking means, a main control means of digital control type connected to said displacement control means for generating a sequence of control signals used to operate said displacement control means according to a predetermined sequence and detecting means for digitally detecting the axial displacement of said piston rod to feed back the digital signal representative of the detected axial displacement of said piston rod to said main control means of digital control type, said detecting means comprises:

a rod coupled to said piston;

a sleeve covering said rod;

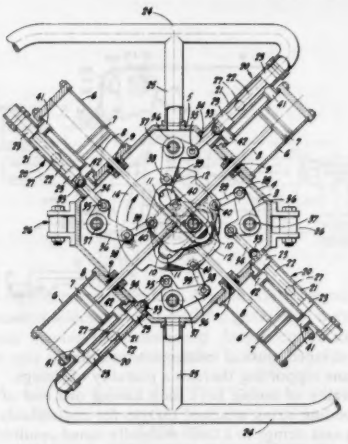
an analogue to digital converter coupled to said rod such that said analogue to digital converter generates a pulse train as said rod moves together with said piston;

a means for detecting when said rod has moved a predetermined distance inside of said sleeve;

a reference pulse generator for generating a train of pulses in response to said rod position detector when said rod reaches said predetermined position; and

a means for comparing said train of pulses from said analogue to digital converter with said train of pulses from said reference pulse generator.

4,106,391
MOTOR
Roland T. Wheeler, 744 Empire Ave., Modesto, Calif. 95351
Filed Jan. 31, 1977, Ser. No. 764,232
Int. Cl.[2] F01B *3/10*
U.S. Cl. 91—481 **4 Claims**

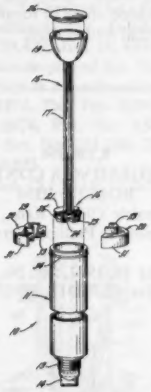


1. A radial type, fluid pressure actuated motor comprising a support, sets of opposed cylinders mounted on the support, the cylinders of each set being spaced in alinement, pistons reciprocable in such cylinders, a support-mounted crankshaft axially centered between the sets of opposed cylinders, a connecting rod extending in common between the pistons of each set of opposed cylinders, each connecting rod being formed centrally of its ends with a yoke having an elongated transverse slot therein, the yokes being disposed side by side with the slots in intersecting relation, the crankpin of the crankshaft extending in journaled but slidable relation through the slot of both yokes, a fluid pressure supply conduit, valves corresponding to each cylinder of each set thereof, and motion-transmitting means connected to and extending between the yokes and valves operative to cause actuation of the latter to effect feed of fluid pressure from said conduit to, and exhaust the same from, the cylinders in a predetermined cyclic order wherein the pistons of each set are simultaneously powered on each stroke, and produce, through the medium of said connecting rods and yokes, rotative motion of the crankshaft; said motion-transmitting means including, for each valve of each set of cylinders, one part connected to the valve, and another part connected to the yoke of the other set of cylinders.

4,106,392
HAND-OPERATED PUMP
Arthur L. Johnson, Jr., and Marlow W. Dodge, both of Rockford, Ill., assignors to Johnson Enterprises, Inc., Rockford, Ill.
Filed Feb. 3, 1977, Ser. No. 765,078
Int. Cl.[2] F16J *1/10;* **B67D** *5/42;* **F04B** *21/04*
U.S. Cl. 92—128 **5 Claims**

1. A pump comprising a cylinder having inner and outer ends, an outlet at the inner end of said cylinder, a plunger extending into said cylinder from the outer end thereof, said plunger being formed of plastic and comprising (a) a piston telescoped slidably into said cylinder, (b) an elongated stem molded integrally with said piston and extending outwardly from said cylinder, and (c) an enlarged hand grip molded

integrally with the outer end of said stem, and means covering the outer end of said cylinder, said means comprising first and



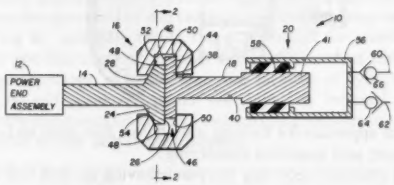
second substantially semi-circular caps telescoped with said cylinder and telescopically receiving said stem.

4,106,393

CLAMP - SELF ALIGNMENT

James C. Dodson, and Harold S. Labyer, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Division of Ser. No. 674,693, Apr. 8, 1976, Pat. No. 4,033,701.
This application Nov. 26, 1976, Ser. No. 745,502
Int. Cl.[2] F16J *15/18*
U.S. Cl. 92—168 **1 Claim**



1. A self-centering clamp having a central axis for coupling a reciprocating push rod having a central axis and a reciprocating plunger having a central axis in a pump assembly having a power end assembly and a fluid end assembly such as to maintain said clamp centered relative to one of said reciprocating push rod and said reciprocating plunger and effect self-alignment of said reciprocating plunger within the fluid end assembly of said pump assembly, said clamp having the central axis thereof laterally displaced from the central axis of one of said reciprocating push rod and said reciprocating plunger, comprising:

(a) an outwardly tapered head on one of said reciprocating push rod and said reciprocating plunger;

(b) a flat radial head on the other of said reciprocating push rod and said reciprocating plunger;

(c) said self-centering clamp including a pair of semi-circular sections, each section of said pair of semi-circular sections having a radially inward facing cavity extending substantially uniformly along the arc of each said section and each cavity having a first and second wall and a bottom;

each said first wall having a flat radial surface slidably receiving said flat radial head;

each said second wall having a substantial portion thereof angled toward the bottom of said cavity and slidably receiving said outwardly tapered head; and

(d) means jointly positioning each said semi-circular section to encase said tapered head and said flat radial head of said reciprocating push rod and said reciprocating plunger for permitting temporary transverse movement of said reciprocating push rod and said reciprocating plunger relative to each other to establish alignment of said reciprocating plunger within said fluid end assembly of said pump assembly;

said pair of semi-circular sections being operable when engaged with said tapered head and said flat radial head of said reciprocating push rod and said reciprocating plunger and with the ends of said reciprocating push rod and said reciprocating plunger being laterally slidably engaged, to cooperate with said tapered head and said flat radial head to permit unitary reciprocative movement of said reciprocating push rod and said reciprocating plunger,

with the central axis of said reciprocating push rod and the central axis of said reciprocating plunger undergoing displacement in relative to each other response to said reciprocating movement while remaining in mutually, generally parallel relation, and with said tapered head and said flat radial head of said reciprocating push rod and said reciprocating plunger remaining in generally axially abutting relation;

said pair of semi-circular sections being operable to undergo joint reciprocating movement with said reciprocating push rod and said reciprocating plunger, while said central axis of said reciprocating push rod and said central axis of said reciprocating plunger are displaced relative to each other,

with the angled portion of said second wall of said pair of semicircular sections and said tapered head of one of said reciprocating push rod and said reciprocating plunger cooperating to wedgingly urge said tapered head and said flat radial head of said reciprocating push rod and said reciprocating plunger into a relatively mutually immobilized condition with said axis of said reciprocating push rod and said axis of said reciprocating plunger being displaced relative to each other;

said tapered head and said flat radial head being alternately subjected to pushing and pulling forces during said reciprocating movement and being mutually displaceable, generally laterally of said reciprocating movement and in response thereto, to effect said mutual displacement of said central axis of said reciprocating push rod and said central axis of said reciprocating plunger during, and in response to, said reciprocating movement; and

said pair of semi-circular sections remaining substantially centered in relation to said one of said reciprocating push rod and said reciprocating plunger and said tapered head thereof by said tapered head cooperating with the angled portion of said second wall and said flat radial head cooperating with the flat radial surface of said first wall of said pair of semicircular sections during said mutual displacement of said central axis of said reciprocating push rod and said central axis of said reciprocating plunger, while said other of said reciprocating push rod and said reciprocating plunger and said radial head thereof are laterally displaced relative to said pair of semi-circular sections during and in response to said reciprocating movement as permitted by relatively reduced frictional engagement between said reciprocating push rod and said reciprocating plunger ends while said reciprocating push rod and said reciprocating plunger ends are slidably engaged prior to said relative immobilizing of said central axis of said reciprocating push rod and said central axis of said reciprocating plunger.

4,106,394

METHOD OF FORMING A WRAPPING FOR A SHIPMENT UNIT AND DEVICE FOR CARRYING OUT THE METHOD

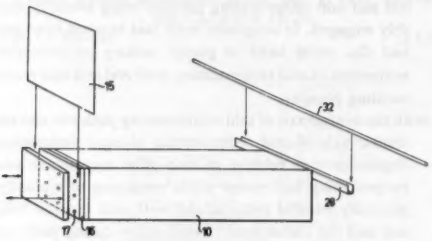
Theodor Själander, Nipstadsgatan 11, 881 00 Solleftea, Sweden

Filed Feb. 11, 1977, Ser. No. 767,840

Claims priority, application Sweden, Feb. 12, 1976, 7601601

Int. Cl.[2] B31D *5/00*; B31B *17/00*

U.S. Cl. 93—1 F **17 Claims**



1. The method of forming a wrapping for a substantially rectangular block unit of material to be shipped in which said wrapping comprises a center piece which is the same length as the said unit and encloses the said unit on three sides thereof and having at least one fixed end-piece at one end comprising the steps of:

folding at least one end of said center piece into a U-shaped configuration;

placing a rectilinear end piece over said U-shaped one end and overlapping three edges with the respective closed sides of said configuration and with a fourth side of said end piece substantially in the plane of the open side of said configuration;

joining said three overlapped edges while holding said end piece in position adjacent said one end of said center piece; and

placing a drawing cord transversely of said other end of said center piece and joining same.

4,106,395

METHOD AND APPARATUS FOR PRODUCING STACKS OF FOLDED BAGS

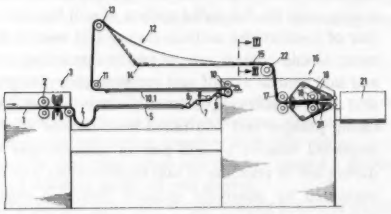
Kurt Rochla, Lengerich, Fed. Rep. of Germany, assignor to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

Filed Nov. 17, 1976, Ser. No. 742,608

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1975, 2551569

Int. Cl.[2] B31B *23/26*

U.S. Cl. 93—35 R **6 Claims**



1. A method of producing stacks of folded bags from a chain of formed bags, the bags being formed from a tubular or semi-tubular web having transverse bag-forming weld seams and lines of perforations parallel and adjacent to the transverse weld seams, said method comprising:

folding the chain of formed bags thereby forming connected, individually folded bags;

severing individual folded bags, along the lines of perforations, from the folded chain of formed bags; and

stacking the individual folded bags.

4,106,396

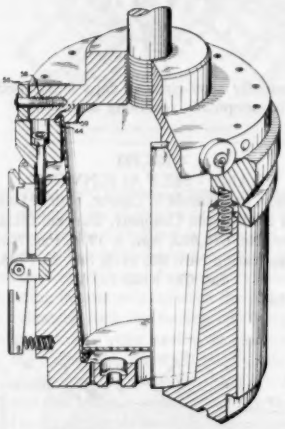
APPARATUS FOR FORMING A CONTAINER HAVING A ROLLED RIM

Frank P. Richards, Prairie Village, Kans., and Jerry W. Young, Weston, Mo., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 18, 1977, Ser. No. 798,217

Int. Cl.[2] B31B *17/02*

U.S. Cl. 93—36.5 R **13 Claims**



1. An apparatus for forming a bead on a free open end of a container, said apparatus comprising:

(a) a container receiving receptacle having an open free end with a first surface defining the free end, said receptacle having a container receiving pocket therein extending inwardly from the open free end;

(b) a ring having a through bore communicating with said pocket, said ring also having second and third surfaces with said second surface being adjacent said first surface;

(c) first means movably mounting said ring on said receptacle wherein said ring is movable between an extended position away from said receptacle and a retracted position adjacent said receptacle with said first means also biasing said ring to the extended position, said ring having an annular first groove recessed in said third surface;

(d) latch means cooperating with said ring and operable to releasably retain said ring in its retracted position;

(e) second means cooperating with said latch means for selectively releasing same from retaining said ring in its retracted position;

(f) a forming head positioned adjacent to said ring and having a fourth surface with an annular second groove therein selectively cooperating with said first groove to form a substantially enclosed bead forming groove; and

(g) third means with said forming head mounted on a portion thereof, said third means being operable for rotating said forming head and for selectively moving said forming head between an extended portion adjacent to and engaging said ring and a retracted position remote from said ring.

4,106,397

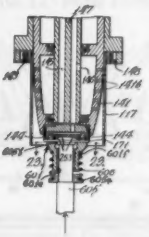
PICK-UP HEAD ASSEMBLY FOR USE IN APPARATUS FOR FABRICATING THERMOPLASTIC CONTAINERS

Stephen W. Amberg, 1004 Glann Rd., Toledo, Ohio 43607, and Thomas E. Doherty, 7 Carriage La., Setauket, N.Y. 11733, assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 479,421, Jun. 14, 1974, Pat. No. 3,970,492, which is a continuation-in-part of Ser. No. 354,305, Apr. 25, 1973, abandoned, which is a continuation-in-part of Ser. No. 211,259, Dec. 23, 1971, Pat. No. 3,995,740, and Ser. No. 473,998, May 28, 1974, Pat. No. 3,995,740, which is a continuation of said Ser. No. 211,259. This application May 6, 1976, Ser. No. 683,893

Int. Cl.[2] B31B *17/02*

U.S. Cl. 93—55.1 R 3 Claims



1. A pick-up head assembly for use in conveying a circular disc to the bottom of a container forming mandrel, comprising: a vertical carrier rod; means slidable along said carrier rod comprising, a dish-shaped member having an axial bore therein adapted to receive said carrier rod; said dish-shaped member has an annularly recessed center portion in the upper surface thereof, means resiliently positioning said dish-shaped member along the upper end of said carrier rod; a disc carrying member having an upwardly facing recessed portion for receiving a disc; said disc carrying member being positioned on said dish-shaped member; said disc carrying member is cylindrically shaped and positioned within said annularly recessed center portion and means biasing said disc carrying member upwardly relative to said dish-shaped member.

4,106,398

METHOD AND APPARATUS FOR THE TRANSVERSE FOLDING OF A CONTINUOUS TUBULAR SLEEVE

Marcel Buisson, 3 Place des Halles, Chartres, France (28000)

Filed Nov. 29, 1976, Ser. No. 745,563

Claims priority, application France, Mar. 23, 1976, 76 08307

Int. Cl.[2] B31D *5/04*

U.S. Cl. 93—84 TW 41 Claims

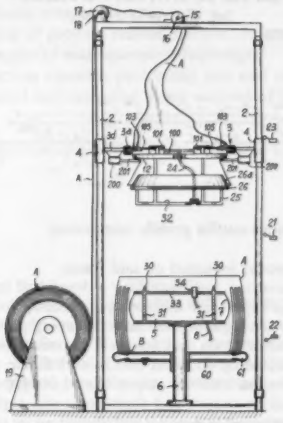
1. A method of folding a continuous length of tubular material to form a package comprising a plurality of concentric layers juxtaposed concentrically adjacent to each other, comprising the steps of:

holding open the tubular material in the vicinity of a free end thereof;

gripping the tubular material at a distance from the free end at least equal to twice the length of one of the juxtaposed concentric layers;

moving the gripped portion of the tubular material into juxtaposition adjacent to the free end of the tubular material and folding the tubular material over itself to form two concentric layers one overlying the other from the material between the free end and the gripped portion;

releasing the gripped portion; and,



cutting the folded tubular material to form the package of concentric layers juxtaposed concentrically adjacent to each other.

4,106,399

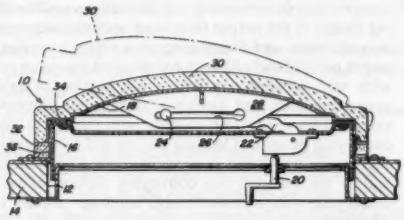
VEHICLE ROOF VENTILATOR INSULATION COVERING

George C. Lawrence, Jr., 294 Hickory La., Lennon, Mich. 48449

Filed Mar. 8, 1977, Ser. No. 775,543

Int. Cl.[2] B60H *1/26*

U.S. Cl. 98—2.14 6 Claims



1. An insulative cover for a ventilator formed in a roof of a vehicle, the ventilator being comprised of a stationary frame member mounted about the periphery of an opening in the roof or the like of said vehicle and a movable dome member hingably mounted to the frame member, the insulative cover comprising:

an upper cover member formed of insulative material and having inner wall portions formed in the shape of exterior surface portions of the dome member, said inner wall portions fitting contiguously to said exterior surface portions of the dome member; and,

a lower cover member formed of insulative material and having inner wall portions formed in the shape of exterior surface portions of the frame member, said inner wall portions fitting contiguously to said exterior surface portions of the frame member.

4,106,400

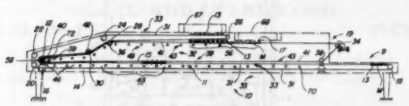
CONTROLLED PROCESS MUFFIN GRIDDLE

Eugene M. Noel, Lowell St., Humarock, Mass. 02047

Filed Jul. 14, 1977, Ser. No. 815,496

Int. Cl.[2] A47J *37/00*

U.S. Cl. 99—373 **9 Claims**



1. A continuous muffin griddle comprising:

a. a frame;

b. a prime mover mounted on said frame;

c. a cup conveying web including a doughball loading station at the input end thereof operationally mounted on said frame having a forward cup conveying portion operationally mounted on said frame in horizontal orientation thereon including an input end in coordinate conveying communication with the output of said doughball loading station and an output end therefrom, and a plurality of burners arranged in parallel distributed array thereunder; said cup conveying web having a driving connection with said prime mover at its output end; a cup turnover portion, having a cup turnover means, operationally mounted on said frame having an input in coordinated conveying communication with the output end of the forward conveying portion of said cup conveying web; a backward cup conveying portion of said cup conveying web operationally mounted on said frame in horizontal orientation thereon and vertically spaced above the forward cup conveying portion of said cup conveying web including an input end in coordinated conveying communication with the output of the cup turnover means and a terminating end therefrom; and a cup return conveying portion of said cup conveying web operationally mounted on said frame having its input end in coordinated conveying communication with the output end of said backward cup conveying portion and its output end in coordinated conveying communication with the input to said doughball loading station; and

d. a cover/hearth conveying web including a muffin offloading station at the output therefrom operationally mounted on said frame and functioning as a cover traveling over and in parallel and adjacent coordinated traveling relation with said forward cup conveying portion of said cup conveying web, and having a starting end thereover in extended forward travel relation with respect to said cup conveying doughball loading station and an output end in coterminus travel and concentric relation with the output end of the forward cup conveying portion of said cup conveying web; a cover/hearth turnover portion operationally mounted on said frame having an input in coordinated conveying communication with the output end of the forward conveying portion of said cover/hearth conveying web and in operational connection with said cup turnover means in said cup conveying web for coordinated cooperation therebetween; a backward cover/hearth conveying portion of said cover/hearth conveying web operationally mounted on said frame beneath the backward conveying portion of the cup conveying web and functioning as a hearth plate traveling in parallel and adjacent coordinated relation with the backward cup conveying portion of said cup conveying web, said backward cover/hearth conveyor portion having a plurality of burners arranged in parallel distributed array thereunder and having a muffin offloading station in extended backward travel relation with respect to the terminating end of said backward cup conveying portion of said cup conveying web, and a driving connection with said prime mover at said muffin offloading station; and a cover/hearth return conveying portion of said cover/hearth conveying web operationally mounted on said frame in coordinated conveying communication with the muffin offloading station at the output end of said backward cover/hearth conveying portion.

4,106,401

HAND-OPERATED SQUEEZER FOR EXTRACTING THE JUICE FROM CITRUS FRUITS

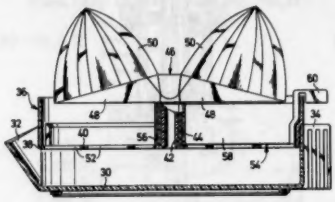
Peter Ackeret, Kusnacht, Switzerland, assignor to Zyliss Zysset AG, Lyss, Switzerland

Filed Oct. 6, 1976, Ser. No. 730,198

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1976, 2635503

Int. Cl.[2] A23N *1/00*; A47J *19/02*

U.S. Cl. 99—508 **25 Claims**



1. A hand-operated squeezer for the extraction of juice from citrus fruits, the squeezer comprising at least one pair of substantially upright, but oppositely inclined and generally conical squeezer members of the same size and shape and having inclined axes converging on each other in a downward direction, wherein the squeezer members are so arranged with respect to one another that they may be used for the simultaneous squeezing with both hands of fruit halves of approximately the same size with approximately the same expenditure of force and time, the forces occurring upon simultaneous squeezing of two fruit halves on the two squeezer members substantially cancelling each other out.

4,106,402

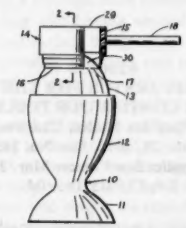
EGG SHELL BREAKER

James Constantine Gevas, One Ford La., Roseland, N.J. 07068

Filed Nov. 26, 1976, Ser. No. 745,413

Int. Cl.[2] A47J *43/00*

U.S. Cl. 99—571 **12 Claims**



1. A tool for breaking the shell of an egg and severing an end segment therefrom comprising a hollow cylindrical body with a shell engaging edge at one end for disposition over and about an end of said shell with said edge engaging said shell along a circular line of contact lying intermediate the equator and a pole, said body having a circumferential section immediately adjacent said edge which section has a wall with substantially right circular cylindrical radially inner and outer surfaces and a thickness throughout its length of the same order of magnitude as the thickness of said shell, means strengthening said

section to resist departure from circularity when advanced through said shell, and means for permitting the transfer of kinetic energy to said body generally in a direction parallel to the axis of said body for advancing said body axially through said shell severing said segment from the remainder of the shell for easy removal from said shell remainder.

4,106,403

BAND FEED GUIDES

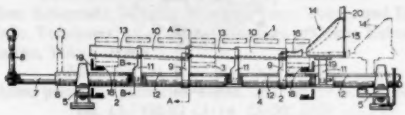
Donald Sutehall, Harlow, England, assignor to Gerrard Industries Limited, England

Filed Mar. 29, 1977, Ser. No. 782,318

Claims priority, application United Kingdom, Apr. 3, 1976, 13618/76

Int. Cl.[2] B65B *13/04*

U.S. Cl. 100—25 **11 Claims**



1. In banding apparatus for securing a load on a pallet and having a band feed guide means for threading banding through the voids between the deck and runners of a pallet and comprising spaced supports with conveyor means positioned thereon for moving said pallet, at least two primary chute sections and at least one secondary chute section, carrier means for mounting the chute sections, the primary chute sections being mounted on the carrier means for movement into the voids of a pallet at the apparatus to join the secondary chute section and form therewith a continuous guide below the deck of the pallet, the secondary chute section being so mounted in the apparatus as to lie between the runners of the pallet.

4,106,404

APPARATUS FOR SEPARATING LIQUIDS AND SOLIDS FROM ONE ANOTHER, ESPECIALLY FOR EXTRACTING JUICE FROM AGRICULTURAL PRODUCTS

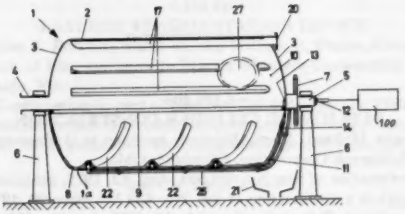
Alfred Schmid, Niederweningen, Switzerland, assignor to Bucher-Guyer AG Maschinenfabrik, Niederweningen, Switzerland

Filed Mar. 31, 1977, Ser. No. 783,266

Claims priority, application Switzerland, Apr. 7, 1976, 4359/76

Int. Cl.[2] B30B *9/12, 5/02*

U.S. Cl. 100—117 **11 Claims**



1. An apparatus for separating liquid and solid materials from one another, especially for the extraction of juice from agricultural products, in particular from fruit, comprising:

a press container;

means for rotatably mounting said press container;

a substantially hood-shaped squeezing diaphragm subdividing the press container into a pressure compartment and a squeezing compartment;

means defining an inlet arrangement for a pressurized fluid medium delivered to said pressure compartment;

means defining a juice outlet arrangement provided for said squeezing compartment;

a plurality of product residue-ejection elements arranged at the region of said squeezing diaphragm;

said ejection elements protruding into said squeezing compartment and extending along sections of a screw line.

4,106,405

CONTROLLED DEFLECTION ROLL

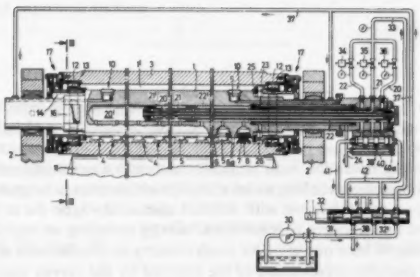
Mario Biondetti, and Ignazio Marchioro, both of Schio, Italy, assignors to Escher Wyss Limited, Zurich, Switzerland

Filed Jul. 1, 1977, Ser. No. 812,280

Claims priority, application Switzerland, Jul. 13, 1976, 8947/76

Int. Cl.[2] B30B *3/04;* B21B *13/02*

U.S. Cl. 100—162 B **8 Claims**



1. A controlled deflection roll arrangement comprising:

a fixed support;

a hollow shell;

means mounting said hollow shell to be rotatable about the fixed support and displaceable relative to said fixed support in the direction of a pressure plane;

at least one hydrostatic contact element disposed between the fixed support and the roll shell;

a counter roll cooperating with said roll shell;

said at least one hydrostatic contact element being operatively effective in the pressure plane and serving to press the roll shell against the counter roll and thus for producing a pressure force of the controlled deflection roll;

at least one hydrostatic lift-off element which is effective in an opposite direction to the effective operative direction of the contact element and serving to lift-off the roll shell from the counter roll;

means defining at least one source of hydraulic pressurized fluid medium;

hydraulic lines for connecting the contact element and the lift-off element with said source of hydraulic pressurized fluid medium;

an outflow conduit for the hydraulic pressurized fluid medium; and

control means for selectively connecting a hydraulic line of the contact element or the lift-off element with said source of hydraulic pressurized fluid medium and for simultaneously connecting the hydraulic line of the element which has been disconnected from the source with an outflow conduit.

4,106,406

PRINT HAMMER APPARATUS

Gerald A. Angelichio, Ilion, N.Y., and Frank A. Digilio, Acton, Mass., assignors to Mohawk Data Sciences Corp., Herkimer, N.Y.

Filed Sep. 17, 1976, Ser. No. 724,427
Int. Cl.[2] B41J *9/36*
U.S. Cl. 101—93.31 21 Claims

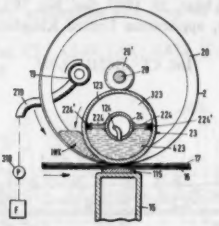
1. In an impact printer having a printer frame to which is mounted carrier means for periodically presenting a plurality of type die to a print line adjacent a document on which a printing operation is to be performed, and a print impacting mechanism, including at least one print hammer arranged to impact the document with selected ones of the type die at the print line, a source of mechanical energy including an impeller having at least one impeller tooth rotating in synchronism with the periodic presentation of the type die by the carrier means, an interposer having a mass smaller than the mass of the hammer and associated with the hammer and arranged for selective movement by a control element from a normal position into the path of motion of the impeller tooth such that the impeller tooth engages the interposer driving it and the associated print hammer from a rest position toward the print line to impact the document with a selected type die, said impeller tooth and hammer having the same plane of motion; said print impacting mechanism being characterized by said print hammer being elongated with a print hammer head at one of its ends and the other of its ends being secured to the impact printer frame by a flat flexure spring adapted to flex in the plane of motion of the print hammer; by said interposer being mechanically coupled to said print hammer in a linkage including an aperture in the print hammer through which the interposer extends and is moveable into and out of the path of said impeller tooth and captivates the smaller mass interposer to travel with the larger mass hammer after engagement of the interposer to travel with the larger mass hammer after engagement of the interposer by the impeller tooth; by said interposer being flexible in the plane of motion of said hammer and impeller tooth and flexing in such plane when engaged by the impeller tooth such that a relatively smooth accelerating force is imparted to the print hammer and such that the removal of the interposer from the path of the impeller tooth and return to the normal position after such engagement is enhanced by such flexing and by the captivation linkage to the print hammer; and by said linkage captivating the interposer to the hammer at a first point in proximity to the hammer head and at a second point in proximity to the other end of the hammer so as to control flexing and oscillation of the interposer between said two points.

4,106,407

DEFLECTABLE HOLLOW SOCKET SQUEEGEE FOR ROTARY SCREEN PRINTER

Mathias Mitter, Schloss Holte, Fed. Rep. of Germany, assignor to Mitter & Co., Schloss Holte, Fed. Rep. of Germany

Continuation of Ser. No. 657,081, Feb. 11, 1976, abandoned. This application Jul. 25, 1977, Ser. No. 818,576
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1975, 2505903
Int. Cl.[2] B41F *15/44*
U.S. Cl. 101—120 10 Claims



1. In a screen printing machine of the type having a roller squeegee and wherein the pressure exerted by the center region of such roller squeegee upon the printing machine to be forced through the printing screen of the machine tends to be less than the pressure exerted thereupon by the end regions of the roller squeegee, resulting in non-uniform printing by the machine, a combination comprising a printing screen having a surface for supporting a printing medium which is to be forced through said printing screen onto a travelling web to be imprinted; squeegee means for forcing said printing medium through said printing screen, said squeegee means comprising a non-rotatable shaft upwardly spaced from and extending substantially parallel to said surface, a driven tubular jacket rotatably surrounding said shaft; a drive shaft parallel to said non-rotatable shaft; drive gears on said drive shaft for driving said tubular jacket pairs of axially spaced shaft bearings at opposite end portions of said non-rotatable shaft, journalling said drive shaft and maintaining said shafts at a predetermined distance from each other; and means for shifting said squeegee means relative to said surface, including means for displacing said jacket relative to said shaft in direction towards said surface and for deforming said jacket into conformance with the contour of said surface when the surface is downwardly bowed in direction away from said shaft, so that the pressure exerted by said jacket is always uniform over the axial length of said tubular jacket.

4,106,408

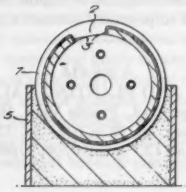
DUPLICATOR CYLINDER CONSTRUCTION

Norman Holland, Liege, Belgium, assignor to Addressograph Multigraph Corporation, Cleveland, Ohio

Continuation of Ser. No. 604,503, Aug. 13, 1975, abandoned, which is a continuation of Ser. No. 420,218, Nov. 29, 1973, abandoned. This application Feb. 22, 1977, Ser. No. 770,330
Int. Cl.[2] B41C *1/18, 3/02;* B22D *19/02*
U.S. Cl. 101—401.1 3 Claims

1. For a lithographic duplicator, a cylinder comprising a support body and a preformed outer layer of stainless steel sheet, the cylinder being so configured as to present a longitudinal surface gap and the stainless steel sheet having its ends bent so as to extend into and define the gap, wherein the support body is of cast iron which has been formed under normal ambient foundry temperature conditions by casting against the

interior of the otherwise unheated preformed outer layer at a pouring temperature at least 150° C above its normal pouring



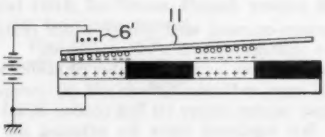
temperature, and thereby bonded to the interior surface of the outer layer throughout its area including the bent ends.

4,106,409

ELECTROSTATIC PRINTING METHOD

Hajime Kobayashi, Mitaka; Yasuhiro Yano, Tokyo, and Ichiro Endo, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 21, 1977, Ser. No. 761,401
Claims priority, application Japan, Jan. 26, 1976, 51-7740
Int. Cl.[2] G03G *13/14, 15/00, 5/04*
U.S. Cl. 101—426 **9 Claims**



1. In a process for electrostatic printing which includes (1) a step for forming an electrostatic latent image by subjecting a printing master to an electric charging treatment, (2) a step of developing the electrostatic latent image, and (3) a step of transferring the developed image onto an image-receiving material, the improvement which comprises: employing an electrostatic printing master formed by

(A) subjecting an image-forming member to a pre-heat treatment to enhance image-forming capability, said member having a first layer, wherein an organic silver salt is dispersed in an electrically insulating medium and a reducing agent is associated with said first layer,

(B) irradiating said image-forming member with an active radiation ray, and

(C) heat-developing said image-forming member.

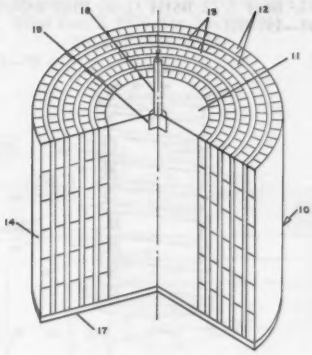
4,106,410

LAYERED FRAGMENTATION DEVICE

Charles A. Borcher, Maitland, and William R. Porter, Orlando, both of Fla., assignors to Martin Marietta Corporation, Orlando, Fla.

Continuation-in-part of Ser. No. 769,464, Aug. 26, 1968, abandoned, which is a continuation-in-part of Ser. No. 518,481, Jan. 3, 1966, abandoned. This application Apr. 28, 1972, Ser. No. 249,458
Int. Cl.[2] F42B *13/48*
U.S. Cl. 102—67 **7 Claims**

1. A layered warhead for projecting a multitude of fragments in a highly controlled pattern, comprising alternating substantially continuous layers of fragments and explosive, means for bringing about an explosive detonation that is propagated through the layers of fragments and explosive at essentially right angles to the intersections between such layers, the occurrence of detonation in the explosive layer nearest said detonation means serving to expand the adjacent fragment layer against its adjacent explosive layer, thus compressing such adjacent explosive layer to a higher energy density before it detonates, such adjacent explosive layer detonating a very small increment of time after the first layer, and at a higher energy density, with such compression taking place with regard to each succeeding explosive layer, thereby increasing the energy in such explosive layers as they eject their respective fragment layers within a few microseconds of each other, and causing the discrete fragment layers to form a spatially desirable explosion pattern.

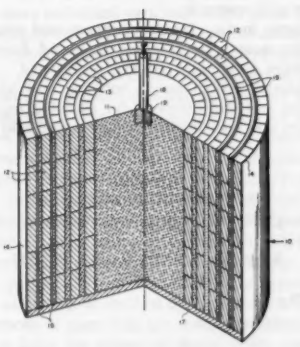


4,106,411

INCENDIARY FRAGMENTATION WARHEAD

Charles A. Borcher, Maitland; William R. Porter, Orlando, and Martin H. Harris, Winter Park, all of Fla., assignors to Martin Marietta Corporation, Orlando, Fla.

Continuation of Ser. No. 103,903, Jan. 4, 1971, abandoned. This application Sep. 2, 1975, Ser. No. 609,777
Int. Cl.[2] F42B *13/48*
U.S. Cl. 102—67 **20 Claims**



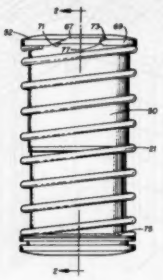
1. A layered incendiary fragmentation device designed to project fragments in a highly controlled pattern, comprising at least two layers of fragmentable material, and at least two layers of explosive material, with a layer of explosive material being utilized for each layer of fragmentable material, at least one layer of pyrophoric material disposed with said fragmentable and explosive layers, said layers being adjacently disposed, yet separate and substantially continuous, extending for a substantial portion of a major dimension of the device, and means for bringing about the detonation of said explosive layers substantially simultaneously so as to cause the outward projection of fragments and pyrophoric material.

4,106,412

FLUID TRUCK BOLSTER SNUBBER

Richard C. Farris, Joshua, and William S. Butler, Burleson, both of Tex., assignors to Halliburton Company, Duncan, Okla.

Filed Apr. 23, 1976, Ser. No. 679,620
Int. Cl.[2] B61F *5/12*; B61H *11/00*; F16F *9/24, 9/38*
U.S. Cl. 105—197 DH **40 Claims**



1. In a motion damping apparatus, the improvement comprising:

a movable piston;

cylinder means, for sealingly surrounding at least a portion of said piston; said cylinder means including end cap means for closing a first end, a second open end axially opposite to said first end, and an internal surface therebetween;

a high pressure chamber between said closed end of said cylinder means and said piston;

a reservoir on an opposite side of said piston from said high pressure chamber;

two-way valve means, in said piston, for allowing relatively unrestricted flow from said reservoir into said high pressure chamber through said piston in response to a slightly lower pressure in said high pressure chamber than in said reservoir and for allowing relatively restricted flow from said high pressure chamber into said reservoir in response to a much higher pressure in said high pressure chamber than in said reservoir;

spiral groove means, disposed between said piston and said cylinder means, for allowing regulated flow bypassing said piston within said cylinder means; and

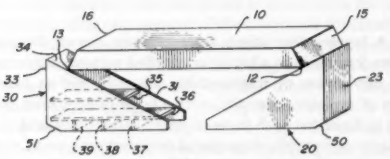
fixed diameter orifice means between said high pressure chamber and said reservoir for allowing regulated flow between said high pressure chamber and said reservoir.

4,106,413

MULTI-POSITION TABLE

Neal B. Hoaglund, R.F.D. Box 3646, Nelson Rd., Boyne City, Mich. 49712

Filed Dec. 5, 1977, Ser. No. 857,375
Int. Cl.[2] A47B *3/00*
U.S. Cl. 108—12 **11 Claims**



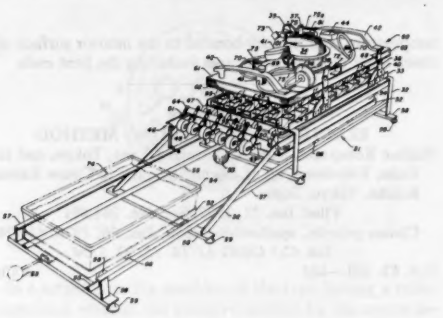
1. A table adapted for multiple positions, comprising a top surface having two opposite ends sloped downwardly and outwardly relative to said top surface; a hinge attached along the bottom of each of said sloped table ends; and a leg structure attached to each of said hinges, each of said leg structures constructed from generally triangular-shaped members with said hinge attachment along one triangular edge so as to permit said triangular edge to pivotally contact a sloped table end.

4,106,414

SEED PLANTER AND PLANTING VALVE THEREFOR

Carl Vastag, 34 Pope Blvd., Prairie View, Ill. 60090

Filed Sep. 20, 1976, Ser. No. 724,866
Int. Cl.[2] A01C *7/04, 5/06*
U.S. Cl. 111—1 **10 Claims**



1. A vacuum-operated seed planter which comprises, in cooperative combination with a vacuum source:

(a) a sealed box-like vacuum chamber (i) having separated parallel upper and lower surfaces and, (ii) communicating with said vacuum source via first conduit means containing a first regulating valve for adjusting the vacuum within said chamber;

(b) a center plate disposed between said upper and lower surfaces, and freely vertically movable within said vacuum chamber;

(c) vacuum-operated diaphragm valve first motor means (i) communicating with said vacuum source via second conduit means containing a second regulating valve for adjusting the vacuum within said first motor means, (ii) connected by shaft means, through the upper surface of said vacuum chamber, to said center plate and, (iii) effecting vertical movement thereof within said vacuum chamber;

(d) a plurality of spaced-apart, seed planting valves connected to the lower surface of said vacuum chamber, said valves (i) having a hollow core housing, a plurality of apertures in the upper end portion thereof, such that said hollow core is in open communication with said vacuum chamber, and a coaxially-disposed center shaft vertically-movable within said hollow core and extending through the upper end of said housing, and, (ii) contacting said center plate, within said vacuum chamber, at the upper extremity of said center shaft;

(e) a seed planter frame containing a plurality of spaced-apart seed storage hoppers;

(f) guide supporting means, in which said seed-planting frame is positioned, (i) disposed a finite distance below the lower surface of said vacuum chamber and, (ii) in turn removably supported by an elongated, substantially rigid frame member containing a movable nursery flat rack, guide means and a soil-containing nursery flat for positioning the rack and nursery flat beneath said seed-planting frame;

(g) a pair of vacuum operated diaphragm valve second motor means (i) attached to opposite edges of said vacuum chamber and, (ii) communicating with said vacuum source via third conduit means containing a third regulating valve for adjusting the vacuum within said pair of second motor means;

(h) vertically-aligned biased hinge means (i) attached to said vacuum chamber and said supporting guide means and, (ii) in hinged connection to said pair of second motor means, said biased hinge means effecting simultaneous horizontal and downward movement of said vacuum chamber with respect to said supporting guide means;

(i) a first plurality of rollers (i) supported by said rigid frame member, (ii) the axis of rotation of which is disposed at right angles to the direction of travel of said nursery flat and, (iii) forming seed-receiving furrows in said soil as the flat is being positioned beneath said seed planting frame; and,

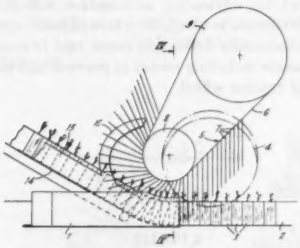
(j) a second plurality of rollers (i) supported by said rigid frame member, (ii) the axis of rotation of which is disposed at right angles to the direction of travel of said nursery flat and, (iii) closing said furrows after seeds have been planted and the flat is being removed from beneath said seed planting frame.

4,106,415

PLANT-SETTING MACHINE

Reijo Sakari Häkli, Iso-Vimma, Finland, assignor to Lannen Tehtaat OY, Iso-Vimma, Finland

Filed Oct. 7, 1976, Ser. No. 730,687
Claims priority, application Finland, Apr. 30, 1976, 761221
Int. Cl.[2] A01C *11/02*
U.S. Cl. 111—3 **7 Claims**



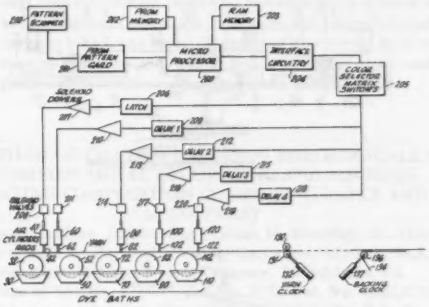
1. A plant setting machine comprising a plowshare for the formation of a furrow, a feeding apparatus mounted behind said plowshare for feeding and guiding plants into said furrow, means mounted behind said feeding apparatus for compressing the soil on both sides of the furrow after the plants have been set therein, and an operating device for holding said plants in an upright position in said furrow until the compressing is completed, said operating device comprising a first pair of laterally spaced pulleys mounted on said machine above and on opposite sides of said furrow and substantially above the point of deposit of said plants in said furrow, a second pair of spaced pulleys mounted on said machine spaced from and parallel to said first pair of pulleys and adapted to be driven in the direction of movement of said plowshare, a pair of endless means interconnecting the corresponding pulleys of said two pairs, and a plurality of flexible members attached to each of said endless means at relatively short intervals whereby said flexible members on each such endless means form a pair of walls on opposite sides of the deposited plants, moving in a direction opposite to that of the movement of said plowshare whereby said walls laterally support said plants and maintain their position until said compressing means compacts the sides of the furrow to fix the position of said plants.

4,106,416

CONTROL APPARATUS FOR TEXTILE DYEING AND TUFTING MACHINERY

James Otto Blackstone, Jr., Lanett, Ala., and Fred Pickett Strother, West Point, Ga., assignors to WestPoint Pepperell, Inc., West Point, Ga.

Filed Dec. 2, 1976, Ser. No. 746,948
Int. Cl.[2] D05C *15/34*
U.S. Cl. 112—79 A **20 Claims**



1. Apparatus for dyeing, individually, yarn ends of a plurality of yarn ends at predetermined positions along their lengths and producing a tufted textile product with a multi-colored predetermined complex design incorporated therein, comprising: a tufting station; a plurality of spaced dyeing stations of different colors; a plurality of yarn control assemblies at each dyeing station, each yarn control assembly controlling one or more individual yarn ends and having a corresponding yarn control assembly at each other dyeing station controlling the same one or more individual yarn ends as the yarns are passed through the dyeing stations; each yarn control assembly being individually controllable by digital color pattern data to cause the dyeing of yarn at its associated dyeing station; a holding register for holding digital color pattern data for each yarn control assembly at a first dyeing station, and for the corresponding yarn control assembly at each other dyeing station; means to present a stitch of sequential digital color pattern data from a predetermined pattern to the holding registers for yarn control assemblies sequentially positioned from one side of a dyeing station to the other side, each holding register then containing digital color pattern data identifying one particular dyeing station having a particular color dye; means to output digital color pattern data from each holding register to the yarn control assemblies at the first dyeing station when predetermined portions of yarn ends are at the first dyeing station, and means to delay the output of digital color pattern data from each holding register to the yarn control assemblies at each other dyeing station until the same predetermined portions of yarn ends are at the other dyeing stations, whereby the stitch of digital color pattern data in the holding registers causes particular yarn control assemblies at particular dyeing stations receiving digital color pattern data to dye the yarn ends they control; and means for presenting each next sequential stitch of digital color pattern data from a predetermined pattern to the holding registers for a corresponding operation; whereby, individual yarn ends are dyed different colors at predetermined positions along their length and a multi-colored predetermined complex design is tufted according to the digital color pattern data presented to the holding registers.

4,106,417

APPARATUS FOR CONTROLLING THE MOVEMENT OF A FABRIC-SUPPORTING CARRIAGE IN A QUILTING MACHINE

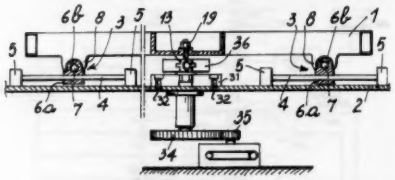
Giannino Landoni, Fagnano Olona, Italy, assignor to MECA S.n.c., Cassano Magnago, Italy

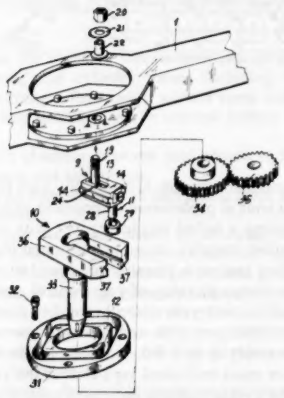
Filed Sep. 27, 1976, Ser. No. 726,757

Claims priority, application Italy, Oct. 3, 1975, 27933 A/75

Int. Cl.[2] D05B *21/00, 11/00*

U.S. Cl. 112—119 **7 Claims**





1. In a quilting machine having a fabric-supporting carriage and a needle-supporting bar and means for guiding the movement of the carriage relative to the bar, which means includes a cam and follower arrangement wherein the cam is a substantially flat member having a groove and the follower includes a pin which engages into the groove, the improvement wherein said cam and follower arrangement comprises a rotatable member comprising a shaft and a shaped guide coupled to said shaft; a slider slidably housed in said guide wherein said slider protrudes from said guide and being mounted for sliding movement with respect to the guide during rotation of the shaft with a first pin connected to said fabric-supporting carriage and with a second pin parallel to said first pin slidably housed within said groove; and means for adjusting distance between said first and second pins.

4,106,418

ONE-STEP BUTTONHOLE MECHANISM FOR SEWING MACHINE

Yasuhisa Hayashi, Osaka, Japan, assignor to White Sewing Machine Company, Cleveland, Ohio

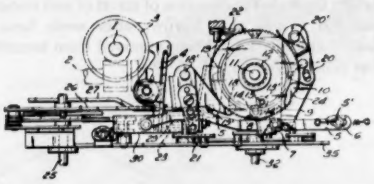
Filed Aug. 30, 1976, Ser. No. 718,810

Claims priority, application Japan, Sep. 11, 1975, 50-125221[U]

Int. Cl.[2] D05B *3/02, 3/06*

U.S. Cl. 112—158 B **4 Claims**

1. In a sewing machine, a device for sewing buttonholes through a continuous sequence of four stages controlled by the machine, comprising a plurality of rotary cams fixed relative to one another for controlling the position of amplitude, base line, and feed modifying elements, means for rotating said cams in incremental steps proportional in number to stitches, control means including means to interrupt stepwise rotation of said cams at the completion of the first stage of sewing through a predetermined fixed number of stitches and the initiation of the second stage, said control means including a manually adjustable element settable prior to initiation of sewing to re-establish stepwise rotation of said cams at the completion of a second stage of sewing through a variable predetermined number of stitches, said control means including means to interrupt stepwise rotation of said cams at the completion of a third stage of sewing through a second predetermined fixed number of



stitches, said cams being arranged to produce a high amplitude and minimal feed during the first stage of sewing, a reduced amplitude, a base line to one side and moderate feed in one direction during the second stage of sewing, a high amplitude and minimal feed during the third stage of sewing, and a reduced amplitude, a base line to the side opposite said one side and a moderate feed in a direction opposite said one direction during the sewing of the fourth stage, wherein said control means includes a ratchet wheel, said cam rotating means including a pawl for advancing said ratchet wheel in timed relation to the formation of stitches, said ratchet wheel being arranged to rotationally drive said cams, said first-mentioned interrupting means including means to prevent said pawl from advancing said ratchet wheel.

4,106,419

SEWING MACHINE

Marcel Fresard, Petit-Lancy, Switzerland, assignor to Mefina S.A., Fribourg, Switzerland

Filed Mar. 8, 1977, Ser. No. 775,652

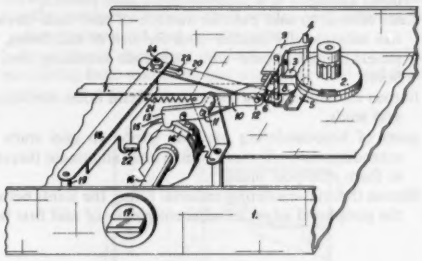
Claims priority, application Switzerland, Mar. 16, 1976, 3234/76

Int. Cl.[2] D05B *3/02*

U.S. Cl. 112—158 A **1 Claim**

1. In a zig-zag sewing machine comprising a frame housing a series of cams juxtaposed on a drive-shaft for controlling oscillation of a needle-bar cradle by means of a set of transmission elements comprising a slide able to oscillate about an axis parallel to said drive-shaft and a feeler rotatably connected with the slide and able to move parallel to said drive shaft, and manual cam-selection means for controlling movement of said feeler, said cam-selection means including first and second cam profiles, said first cam profile enabling the feeler to be spaced apart from the series of juxtaposed cams, said second cam profile producing movement of the feeler parallel to said drive-shaft, the improvement comprising a lever having first and second ends, said first end articulated to the frame of the machine, a rod connected to the second end of said lever and connecting it to said slide, a cam follower fixed on said lever, said first cam profile cooperating with said cam follower, a second lever including first and second ends and pivotally

mounted on the frame of the machine about an axis perpendicular to said drive-shaft, said second cam profile cooperating



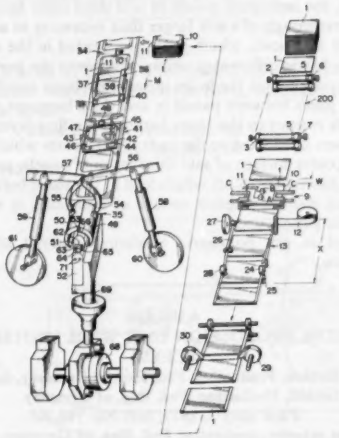
with the first end of said second lever, the second end of said second lever controlling movement of said feeler.

4,106,420

APPARATUS FOR FORMING CANS

Yuzo Takahashi; Yasuyuki Tanaka; Katsumi Nagai; Nobuo Takahashi; Hiroshi Matsuda; Koichi Ono; Kozi Tanaka, and Shiro Oyama, all of Iwatsuki, Japan, assignors to Hokkai Can Co., Ltd., Tokyo, Japan

Filed Mar. 24, 1977, Ser. No. 780,840
Int. Cl.[2] B21D *51/26*
U.S. Cl. 113—12 **6 Claims**



1. An apparatus for forming cans comprising:

a plurality of pairs of can blank end pressing devices, each provided with a pair of rolls having a parallel axis at a different elevation from each other, one roll of said pair of rolls having at least one end portion thereof tapered at an angle sequentially increasing in said plurality of pressing devices;

a high-frequency induction heating means for heating said can blank end portions;

an organic adhesive film sticking device provided with a U-shaped guide roll for folding an organic adhesive film into a U-shape or V-shape and feeding the folded adhesive film toward said can blank end portions and a pair of rolls for sticking said adhesive film under pressure onto said blank ends from the upper and lower sides;

a high-frequency induction heating means for melting said organic adhesive film stuck onto said blank end portions; and

a can forming device composed of a forming horn provided at the underside thereof with a cooling and pressure accepting member disposed in a spline-like manner through a heat insulating material, left and right wing-like members opposed to each other and moveable so as to form a substantially circular shape in section, and a liquid-cooled hammer which can move upward and downward so as to overlap, squeeze and join together said can blank end portions.

4,106,421

METHOD OF COATING UTILIZING RHEOLOGICALLY MODIFIED METAL DECORATING AND AQUEOUS COATING COMPOSITION COMPRISING LATEX AND AMINOPLAST

Thomas H. Haag, Feasterville; William H. Brendley, Jr., Hatboro, both of Pa., and Richard Martorano, Marlton, N.J., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 372,447, Jun. 21, 1973, Pat. No. 4,062,821, which is a continuation-in-part of Ser. No. 333,594, Feb. 20, 1973. This application Feb. 25, 1977, Ser. No. 771,876
Int. Cl.[2] B21D *51/26*
U.S. Cl. 113—120 A **11 Claims**

1. A method of decorating a substrate comprising the steps of coating said substrate with a pigmented or unpigmented thermosettable composition comprising an alkaline aqueous blend having a binder consisting essentially of:

A. a latex of a water-insoluble addition copolymer of (1) 28 to 70% of a monovinyl aromatic monomer, (2) 18 to 68% of at least one ester of acrylic or methacrylic acid, (3) at least one olefinically unsaturated monomer having at least one of an amide and a hydroxyl group, and (4) an olefinically unsaturated monomer having a carboxyl group, the amount of (3) being from 1.5 to 10% when said monomer contains an amide group and from 1.5 to 15% when said monomer contains a hydroxyl group, and the amount of (4) being from 0.5 to 5% based on the total weight of monomers, the T_g of the polymer being below 45° C., the total of (1), (2), (3), and (4) being 100, and

B. a water-soluble condensation product of urea or a triazine with formaldehyde or a water-soluble methanol or ethanol ether thereof,

the weight ratio of A to B on a solids basis being from 35:65 to 65:35, the minimum film-forming temperature of the composition being no higher than about 25° C., the solids content of the composition being between 40 and 80% by weight, said composition containing from 1 to 5% by weight based on the weight of the solids in the composition of a water-soluble rheology modifier in the form of a polyethylene glycol, the amount of the coating being such as to provide a final cured layer of 0.05 to 5 mils in thickness, and heating the coating until it is thermoset.

4,106,422

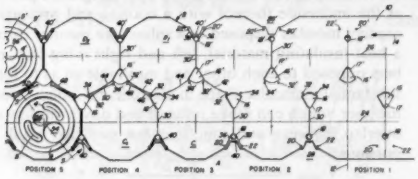
METHOD FOR MANUFACTURE OF CAN END CLOSURES

Fred W. Buhrke, Arlington Heights, Ill., assignor to Buhrke Industries, Inc., Arlington Heights, Ill.

Filed Mar. 14, 1977, Ser. No. 776,949
Int. Cl.[2] B21D *51/44*
U.S. Cl. 113—121 C **12 Claims**

1. The method of making convenience opened can tops from a metallic web of coil stock which comprises the steps of piercing, marginally notching, and lancing the web according to a predetermined pattern at longitudinally spaced intervals to define a series of identical individual can top blanks which are

part of a web layout comprising a plurality of nested and integrally connected rows of said blanks and in which all of said blanks in said web are spaced apart on equal centers, lancing the web between the adjacent rows of blanks with substantially parallel pairs of cuts extending between the blanks of one row and the adjacent blanks of a contiguous row



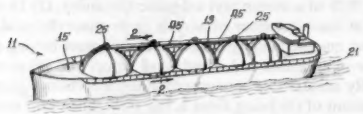
to separate the rows from each other except for simultaneously formed flexible links extending between the parallel cuts to connect the blanks of the one row with those of the other row, and then passing the thus prepared web over the necessary stations of a single progressive die to draw and countersink each web blank to form a complete can top panel therein while the web material acts as a carrier of the blanks.

4,106,423

WEATHER COVERS FOR TANKERS

Rolf D. Glasfeld, Cohasset, and Jan G. Morrill, Leominster, both of Mass., assignors to General Dynamics Corporation, St. Louis, Mo.

Filed Oct. 28, 1976, Ser. No. 736,478
Int. Cl.[2] B63B *25/08*
U.S. Cl. 114—74 A **14 Claims**



1. A liquid-transporting cargo ship comprising a hull, a main deck connected to said hull, at least one cargo tank for holding liquid disposed in said hull and extending above said main deck, and a cover surrounding the above-deck portion of said tank, said cover being generally a section of a spheroidal surface and including at least three self-supporting subsections formed of metal plating, each of which subsections is curved in two directions and is connected along its bottom edge to said main deck, and also including at least three expansion members, each expansion member being joined to the lateral edges of two adjacent subsections and being generally tubular in cross section and having a thickness less than the thickness of said cover subsections so as to resiliently deflect when subjected to stresses and thereby protect the shape of said cover subsections.

4,106,424

INSULATED MARINE CONTAINER FOR LIQUEFIED GAS

Alan L. Schuler, Hingham, and David L. Post, South Weymouth, both of Mass., assignors to General Dynamics Corporation, St. Louis, Mo.

Filed May 26, 1977, Ser. No. 800,702
Int. Cl.[2] B63B *25/08*
U.S. Cl. 114—74 A **9 Claims**

1. An insulated marine container for holding liquefied gas which container comprises

a metal tank having the general shape of a surface of revolution and designed to contain a liquefied gas by maintaining a low temperature therewithin,

means for supporting said tank aboard a marine carrier, and

a thermal insulation barrier surrounding the exterior surface of said tank for maintaining said low temperature by minimizing the flow of ambient heat thereinto,

which barrier includes

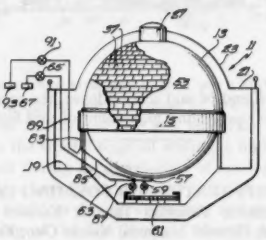
a first layer of panels formed of a foamed polymeric material, said panels of said first layer each having at least four holes arranged in a predetermined hole pattern,

studs affixed to said exterior surface of said tank having a size substantially smaller than the size of said holes, said panels being disposed with said studs extending into said holes,

fibrous insulation filling the region of said holes surrounding said studs,

posts of heat-insulating material joined to said studs and extending outward therefrom in axial alignment therewith to form stud-post units,

fibrous thermal-insulating material filling the joints between the peripheral edges of adjacent panels of said first layer,



a second layer of fibrous insulating material surrounding and in contact with the outer surface of said first layer of panels, said second layer being impaled upon said stud-post units,

a third layer of panels formed of a foamed polymeric material, the individual panels of said third layer having holes therethrough of a size larger than necessary to accommodate said posts, which holes are located in the same pattern but in different positions relative to the periphery of the panels than the holes in said first layer panels, so that the joints between panels in said third layer are staggered with respect to the joints between the first layer panels,

fasteners connected to the ends of said posts which contact the outer surface of said third layer of panels, said fasteners having apertures which lead to the space between said posts and the interior surface of said holes in said third layer panels, and

foamed in situ polymeric insulating material filling said space.

4,106,425

MARINE PROPULSION UNIT WITH PROTECTED SCREW

Ludwig Gruber, Freilassing, Fed. Rep. of Germany, assignor to John GmbH, Freilassing, Fed. Rep. of Germany

Filed May 3, 1977, Ser. No. 793,305
Claims priority, application Fed. Rep. of Germany, May 11, 1976, 2620770
Int. Cl.[2] B63H *5/14*
U.S. Cl. 115—42 **11 Claims**

1. A marine propulsion unit comprising:

(a) an elongated casing having an axis and formed with an elongated, axial passage therethrough,

(1) said passage including four consecutive, axially joined sections of substantially circular cross section,

(2) a first one of said sections being substantially bell-shaped and tapering toward the second section,

(3) a third section tapering substantially conically from the second toward the fourth section,

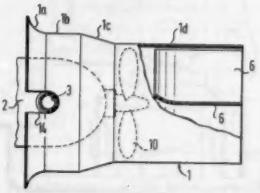
(4) the second and fourth sections being substantially cylindrical, said fourth section being smaller in diameter and axially longer than said second section;

(b) an approximately torpedo-shaped housing mounted in said passage, said housing being of substantially circular cross-section about said axis,

(1) one axial end portion of said housing projecting outward of said casing through said first section,

(2) the other axial end portion of said housing being spacedly enveloped by said third section and tapering in a direction toward said fourth section;

(c) drive means including a shaft substantially coaxially projecting from said other end portion toward said fourth section;



(d) a screw mounted on said shaft in said fourth section adjacent said third section for rotation by said drive means about said axis,

(1) said housing and said casing radially defining therebetween an annular portion of said passage, said portion being of a length and width to prevent accidental insertion of a human limb into said passage through said first section to a depth sufficient to reach said screw;

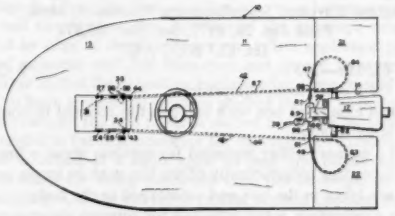
(e) a plurality of baffle plates radiating from said axis in said fourth section and defining orifices of said passage therebetween, the spacing of said orifices from said screw being sufficiently great and the size of each orifice being sufficiently small to prevent accidental insertion of a human limb into said passage through said fourth section to a depth sufficient to reach said screw.

4,106,426

BOAT AND STEERING APPARATUS THEREFOR

Daniel Elanzo Wertz, 250 S. Ocean Blvd., Apt. 11D, Boca Raton, Fla. 33432

Filed Oct. 14, 1976, Ser. No. 732,510
Int. Cl.² A63H *5/08*
U.S. Cl. 115—70 **4 Claims**



1. An improved stand up boat suitable for two persons, said boat having a stern wall for attaching an outboard motor, and a steering mechanism for pivoting said motor comprising:

a shallow draft hull, said hull including a molded lower shell including a bow and a stern, and an upper deck including a stern deck portion affixed to said hull;

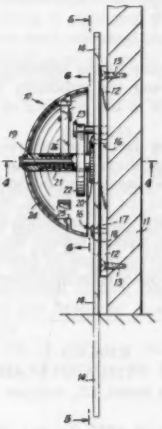
floatation foam filling said hull between said stern deck and said lower shell, said hull including a stern indentation sized to receive an outboard motor, said stern foam portion including a pair of spirally disposed channels, said channels sized to receive steering flexible line, said channels including looped portions proceeding outwardly from the center line of the boat hull, whereby the sizing of said channel and the looped portion thereof provides a frictional restraint on said steering flexible line to hold said outboard motor in a selected position.

4,106,427

ALARM SYSTEM

Charles L. Sabatini, P.O. Box 458, Spring Lake, N.J. 02762

Filed Mar. 9, 1977, Ser. No. 775,830
Int. Cl.² G08B *13/08*
U.S. Cl. 116—90 **3 Claims**



1. An alarm system for detecting and signaling the opening of a movable closure comprising:

a support plate having at least two spaced-apart guide pins and an upstanding arbour mounted thereon;

a toothed rack having a longitudinally extending slot formed therein slidably supported on said support plate for longitudinal reciprocable movement, said guide pins of said support plate being received within said slot of said rack;

a gear rotatably mounted on said support plate and in mesh with the teeth of said rack, said gear having a coaxially-disposed, hollow cylindrical sleeve, secured thereto, which is rotatably supported on said arbour;

a resilient lever arm having an inner end which is coupled to said sleeve for rotation therewith;

spring means coupled to said gear which biases said gear against rotation in a first direction, said spring means comprising a flat, spiral spring, having an inner end which is fixed to said sleeve and an outer end which is fixed to said support plate; and

a bell mounted on the outer end of said arbour, said bell having an interior surface from which inwardly project a plurality of spaced abutments, said abutments being disposed in the path of a portion of said level arm for striking engagement therewith.

4,106,428

SAFETY SHIELD FOR FLANGE TYPE COUPLING

Roy A. Matthiessen, 30 Sandy Hill Rd., Westfield, N.J. 07090

Filed Dec. 30, 1976, Ser. No. 755,859
Int. Cl.² F16L *55/00*; G01N *31/22*
U.S. Cl. 116—114 P **12 Claims**

1. An improved shield having indicating means for a flanged pipe joint carrying a pressurized fluid, comprising:

an elongated porous pliable fabric body having an underside and an overside of a length and a width to be wrapped

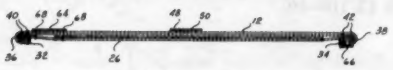
around a pipe coupling with its ends overlapped and with its underside adjacent the pipe coupling and its overside remote therefrom;

connection means for separably connecting said ends together;

a pliable porous liner reinforcing strip maintained at least at one end disposed between said underside and said overside confined wholly within the boundaries of said body and extending centrally longitudinally of said body;

retaining means for separably holding said liner strip in said body against displacement relative thereto;

at least one display means for monitoring pipe coupling



integrity, said display means including chemically sensitive material having the indicating means thereon to change appearance in the presence of given substances; and

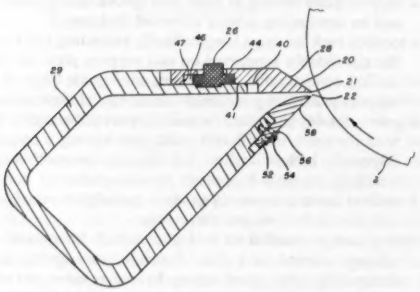
clear envelope means having peripheral edges secured on said overside of said shield to surround said display means to hold said display means and fabric body in assembled relation relative to the pipe flange, so that said display means will provide a visual indication of leakage from the pipe joint that has seeped through the underside, pliable porous liner and overside and be protected by said clear envelope means from outside atmospheric or environmental conditions.

4,106,429

AIR KNIFE WITH ADJUSTABLE LIP

Irvin J. Phillips, South Beloit, Ill., assignor to Beloit Corporation, Beloit, Wis.

Filed May 23, 1977, Ser. No. 799,504
Int. Cl.[2] B05C *11/06*
U.S. Cl. 118—63 **2 Claims**



1. In an air knife having a body member and a pair of lips defining an orifice gap, the improvement comprising:

at least one of the lips being adjustable and having

a. a surface slidably movable on the body member,

b. a plurality of slots, each of the slots extending to permit lip movement toward the orifice gap,

c. a plurality of circular pressure surfaces,

d. a plurality of rims extending about the pressure surfaces;

a plurality of cam plugs, each having a circular cam surface of smaller diameter than the circular pressure surfaces and mounted in the body member with their cam surfaces engaging the pressure surfaces and held in position between the lip and body member by a corresponding rim whereby turning movement of the cam plugs urges the lip to move relative to the body member;

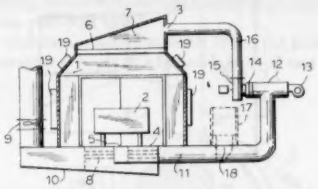
a plurality of screws extending through the slots in the movable lip and mounted in the body member whereby the movable lip is selectively secured relative to the body member upon being positioned by the cam plugs.

4,106,430

SINGLE CHAMBER TYPE COATING AND BAKING APPARATUS

Takashi Nakajima, Nishinomiya; Tomoyuki Irie, Neyagawa, and Keiichi Kusumoto, Sakai, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Mar. 18, 1977, Ser. No. 779,224
Claims priority, application Japan, Mar. 26, 1976, 51-033788
Int. Cl.[2] B05C *15/00*
U.S. Cl. 118—64 **5 Claims**



1. A apparatus for coating and baking an item positioned thereinside, said apparatus comprising:

enclosed chamber means having a ceiling and floor for containing said item a first opening in said ceiling and second and third openings in said floor, said third opening being smaller than and positioned within said second opening, which is smaller than said floor, both of said second and third openings being positioned directly beneath said item in said chamber means;

exhaust means connected to said second opening for exhausting air in said chamber to the outside of said chamber;

heat generating means connected to said first opening for supplying heated air into said chamber; and

recycling means connected to said third opening and to said heat generating means for returning the air in said chamber to said heat generating means.

4,106,431

GUM APPLICATOR

George Frederick Howatt, Holden, Mass., assignor to New England Envelope Manufacturing, Worcester, Mass.

Filed Jan. 28, 1977, Ser. No. 763,574
Int. Cl.[2] B05C *1/02*
U.S. Cl. 118—203 **8 Claims**

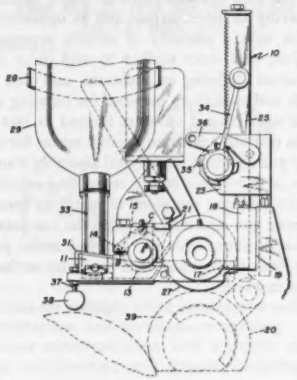
1. Gum applicator, comprising:

(a) an elongated box with an open top adapted to contain a body of gum,

(b) a primary roller mounted for rotation about a first axis extending longitudinally of the box with its lower periphery lying in the box and submerged in the body,

(c) a secondary roller mounted for rotation about a second axis parallel to and spaced from the first axis, the secondary roller being biased toward the primary roller for contact with its surface at a portion hereof as it emerges from the body of gum, and rotatably mounted in a carrier element which in turn is swingable about a third axis spaced from and parallel to the first and second axis, the third axis being located above the primary roller, so that the secondary roller is biased by gravity toward contact with the primary roller, said secondary roller being provided with a central portion of reduced diameter, the length of said central portion being substantially less than

the total length of the portions of said secondary roller which contact said primary roller, and



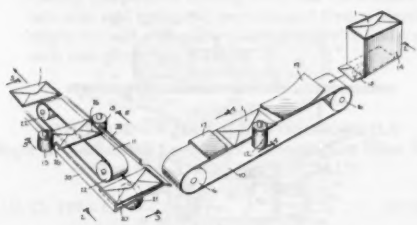
(d) a transfer roller contacting the primary roller to form a small secondary reservoir in the nip between the rollers.

4,106,432

APPARATUS FOR APPLYING CHEMICALS TO ENVELOPES

William H. Gunther, Jr., Guilford, Conn., assignor to Thor Dahl, Inc., New York, N.Y.

Filed Apr. 19, 1976, Ser. No. 677,890
Int. Cl.² B05C *1/02*
U.S. Cl. 118—211 **1 Claim**



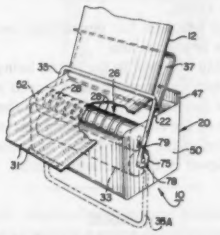
1. A mechanism for applying a chemical solution to envelope edges which comprises a first conveyor for moving an envelope in a first direction, said first conveyor being narrower than said envelope so that an edge of the envelope extends beyond an edge of the first conveyor, a first applicator roller located adjacent said first conveyor and spaced transversely therefrom so that the extending evelope edge contacts said first roller to have a chemical solution applied thereto as the envelope moves past the first roller, a second conveyor mounted at right angles to the first conveyor for moving the envelope in a second direction at a right angle to said first direction, the second conveyor being narrower than the envelope so that opposed edges of the envelope extend beyond opposed edges of the second conveyor, a pair of second applicator rollers located adjacent opposite edges of the second conveyor and spaced transversely therefrom so that said extending envelope edges contact said second rollers to have a chemical applied thereto as the envelope moves past the second rollers, the portions of said first and second rollers which contact said envelope edges being on the same plane as the said conveyors, means for transferring the envelope from said first conveyor to said second conveyor, said transfer means comprising a dead plate interposed between said first and second conveyor, said dead plate being at least as large as the envelope so that the envelope is unaffected by said first and second conveyors while on said dead plate, a transfer roller on said dead plate to move the envelope from said dead plate to said second conveyor, a spring-pressed hold-down shoe being provided over the first conveyor to keep said envelope on said conveyor, said shoe provided with a downwardly extending lip opposite the first roller to contact the envelope and to move the edge of the envelope beyond the conveyor into contact with the first roller, said dead plate extending beneath the second conveyor for at least the greater portion of its length, said transfer roller mounted below said dead plate and extending through an opening in the dead plate between the first and second conveyors to move the envelope into contact with said second conveyor, said second conveyor having a spring-pressed hold-down shoe mounted therewithin, guide rails being provided to guide the envelopes along said dead plate and interruptions in the guide rails to accommodate the applicator rollers, and the applicator rollers being at right angles to the conveyors and being made a porous steel, said dead plate being flat and uninterrupted throughout its area, except for the opening to accommodate said transfer roller.

4,106,433

COATING APPARATUS

Chulani Kumarlal Fernando, 736 Oakwood, Westmont, Ill. 60559; Sangarappillai Asokan, 1047 S. Lewis Ave.; Sangarappillai Nagendran, 1360 S. Finley Rd., both of Lombard, Ill. 60148; Mohanlal Randith Wickramasinghg, 1858 W. 35 St., Chicago, Ill. 60609, and H. Paul Weirich, Box 164, Libertyville, Ill. 60048, assignors to Chulani Kumarlal Fernando, Westmont; Sangarappillai Asokan; Sangarappillai Nagendran, both of Lombard and Mohanlal Randith Wickramasinghg, Chicago, all of, Ill.

Filed Jul. 26, 1977, Ser. No. 819,075
Int. Cl.² B05C *1/12, 1/16*
U.S. Cl. 118—212 **8 Claims**



1. Apparatus for applying liquid to a movable web of moisture-absorbent material, comprising:

an open mouthed container supply means for said liquid;

rotatable , buoyant applicator roll means horizontally mounted and at least partially disposed within said container to float on said liquid whereby to apply liquid to said web when operatively associated therewith;

said roller being journalled in vertical guide-slot means whereby to adapt to change in level of said liquid;

movably mounted cover means adapted in a first position to close said container including the roll therein and in a second open position to permit utilization of said applicator roll;

a horizontally disposed guide bar element comprised of a U-shaped member, pivotally mounted on said container and adapted in a first raised position to hold a lead section of said associated web against a rearwardly disposed surface of said apparatus;

stop means disposed on a forward section of said container and operatively associated a feed motion of said associated web, which is threaded between said bar and said surface, said bar is carried forward against said stop and the web then being movable across the roll to receive the liquid; and

said member being adapted to be selectively moved for-

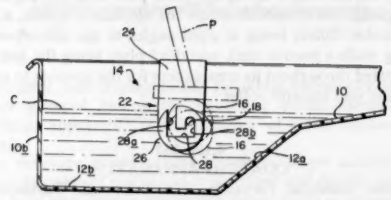
wardly past said stop means whereby the cover may be moved to the closed position when it be desirable to selectively utilize the web in a dry condition.

4,106,434

PAINTER PAD APPLICATOR

Ellsworth Vines, Wellesley, Mass., assignor to Baltimore Brushes, Inc., Brockton, Mass.

Filed Aug. 1, 1977, Ser. No. 820,578
Int. Cl.[2] B05C *1/02*
U.S. Cl. 118—258 **5 Claims**



1. An applicator for applying coating liquid from a container to a painter pad, said applicator comprising

A. an elongated roller, said roller being formed with a circumferential array of lengthwise planar facets or faces adapted for continuous wiping engagement with the pad, the ostensible outer diameter of said roller being appreciably less than the height of the container,

B. a pair of brackets removably secured to the walls of the container,

C. axle means supported by the brackets for rotatively mounting the roller,

D. means on the brackets for permitting the roller to slide relative to the brackets, and

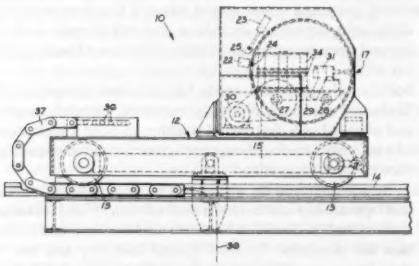
E. said roller being buoyant in the liquid being applied to the pad so that when the brackets are secured to the container filled with the liquid, the roller floats in the liquid with an upper portion of the roller projecting out of the liquid and a lower portion of the roller being immersed in the liquid as the liquid level in the container varies.

4,106,435

APPARATUS FOR MARKING METAL

Eric Douglas Woodhouse, East Kilbride; Alexander Murray Lawrie, Paisley, and Thomas McNeil, East Kilbride, all of England, assignors to Hilti Aktiengesellschaft, Furstentum, Liechtenstein

Filed Mar. 18, 1975, Ser. No. 559,438
Claims priority, application United Kingdom, Mar. 19, 1974, 12055/74
Int. Cl.[2] B05B *15/04*; B05C *5/00*
U.S. Cl. 118—301 **15 Claims**



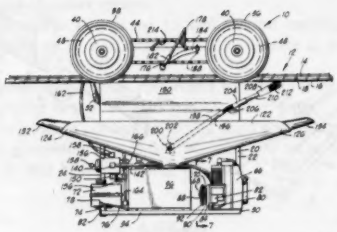
1. Apparatus for applying an identifying marking on the surface of a piece of metal, comprising a molten metal spray gun assembly and a stencil assembly, said stencil assembly including a plurality of side-by-side arranged stencilling members each having an inner surface and an oppositely disposed outer surface with a plurality of serially arranged cut-outs extending from said inner surface to said outer surface and each said cutout defining an indicium, and first means for moving each said stencilling member for locating at least certain selected ones of said cut-outs formed in said stencilling member in an operative position, second means for moving one of said spray gun assembly and stencil assembly transversely of the direction of movement of said stencilling members by said first means for marking the piece of metal by spraying metal from said spray gun assembly through the cut-outs located in the operative position with the sprayed metal passing first through the inner surface and then the outer surface onto the surface to be marked.

4,106,436

APPARATUS FOR DISPENSING A COATING OF LIQUID ON AN ELEVATED CABLE OR THE LIKE

Leslie L. Booker, 1504 Old Mill Rd., Moore, Okla. 73160

Filed Aug. 26, 1976, Ser. No. 717,982
Int. Cl.[2] B05C *5/02*
U.S. Cl. 118—307 **18 Claims**



1. Apparatus for dispensing a coating of liquid on a telephone cable or the like supported above the ground, comprising:

a frame;

support means carried on said frame for supporting said apparatus on a cable for movement of said apparatus therealong;

liquid supply means carried by said frame for providing a quantity of liquid under elevated pressure;

nozzle means carried by said frame and communicating with said liquid supply means for receiving liquid therefrom and directing liquid onto a cable;

hydraulic motor drive means carried by said frame and operatively connected to said support means for propelling said apparatus along the cable upon which it is supported;

conduit means for connecting said hydraulic motor to said liquid supply means for conducting liquid between said hydraulic motor and said liquid supply means to drive said hydraulic motor; and

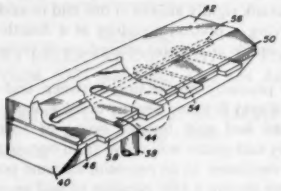
means drivingly connecting said hydraulic motor to said support means for transmitting power from said hydraulic motor to said support means thereby to propel said apparatus.

4,106,437

APPARATUS FOR MULTIPLE STRIPE COATING

Lawrence C. Bartlett, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 22, 1977, Ser. No. 826,616
Int. Cl.[2] B05C 5/02
U.S. Cl. 118—412 8 Claims



1. Apparatus for multiple stripe coating of a web with liquid coating composition, said apparatus comprising:

(1) a hopper communicating with a supply of said liquid coating composition, said hopper including a pair of spaced lips;

(2) a first shim mounted within said hopper and positioned between said spaced lips, said first shim having a plurality of open-ended channels therein;

(3) a second shim mounted within said hopper and positioned between said spaced lips in face-to-face arrangement with said first shim, said second shim having a plurality of projecting portions corresponding in width and location to the desired stripes, said projecting portions aligning with said open-ended channels and extending beyond the open ends thereof; and

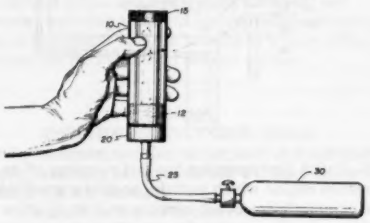
(4) means for advancing the web to be coated across and closely adjacent to said projecting portions to receive coating composition flowing from said open-ended channels onto said projecting portions and form a plurality of stripes on said web corresponding in width and location with said projecting portions.

4,106,438

METHOD OF HANDLING DROSOPHILA

Roger K. Nelson, 415 Layman La., Bloomington, Minn. 55420

Filed Sep. 3, 1976, Ser. No. 720,119
Int. Cl.[2] A01K 29/00
U.S. Cl. 119—1 10 Claims



6. A method of handling Drosophila comprising:

(a) placing a nozzle connected to a controlled source of carbon dioxide gas over a porous plug in a culture container of Drosophila and allowing a series of controlled pulses of carbon dioxide gas to enter into the culture container through the nozzle and porous plug until all flies therein are anesthetized;

(b) removing the nozzle and plug from the container and transferring the flies therein into a sorting container;

(c) sorting the flies in the sorting container into a desired selection;

(d) withdrawing flies in a desired selection from the sorting container to a new culture container by placing a collecting tube near selected flies in the sorting container and applying a vacuum pulse from the culture container through the collecting tube to transport the flies to the new culture container;

(e) placing a porous plug in a new culture container; and,

(f) including an additional step of reanesthetizing flies in the sorting container should activity of the flies be noted during sorting by covering the sorting container with a cover having a porous plug therein and introducing carbon dioxide gas into the sorting container;

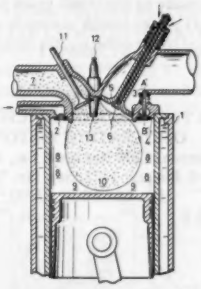
(g) the porous plugs in the cover of the sorting container and the culture container being compressible foam plugs extending beyond the surface of the containers and in which the nozzle for introducing carbon dioxide gas has a conically shaped extremity to compress the edges of the porous plugs sealing the edges to the nozzle and allowing for passage of the carbon dioxide gas into the containers.

4,106,439

INTERNAL COMBUSTION ENGINE

Mitsuhiro Kanao, No. 2156-14, Yakeyamacho, Kure-shi, Hiroshima-ken, Japan

Filed May 25, 1976, Ser. No. 689,892
Claims priority, application Japan, May 27, 1975, 50-63636; Aug. 31, 1975, 50-105755
Int. Cl.[2] F02B 75/02; F01L 3/00
U.S. Cl. 123—75 B 3 Claims



1. In a 4-stroke internal combustion engine, in combination:

(i) a cylinder structure having a cylindrical inner wall surface bounding a combustion chamber, said structure having a head at an end of said inner wall surface, said head including a fuel-air mixture inlet port and an exhaust gas outlet port both spaced radially inwards from the cylindrical inner wall, said head further including an annular air entry port opening into said combustion chamber between (a) the cylindrical inner wall and (b) the inlet and outlet ports

(ii) a fuel-air mixture inlet valve member positioned in and movable to open and close said fuel-air mixture inlet portion

(iii) an exhaust gas outlet valve member positioned in and movable to open and close said exhaust gas outlet port

(iv) an annular air entry valve member positioned in and movable to open and close said air entry port.

4,106,440

ELECTRONIC SPARK TIMING ADJUSTMENT CIRCUIT

Chi Sun Lai, Lake Zurich, and Philip D. Gunderson, Arlington Heights, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

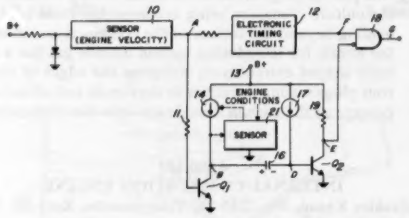
Filed Dec. 31, 1974, Ser. No. 537,726
Int. Cl.[2] F02P 5/04
U.S. Cl. 123—117 R 12 Claims

1. An adjustable electronic spark timing circuit for use with

the ignition system of an internal combustion engine, comprising:

sensor means for providing an input signal, the frequency and period of which is proportional to the speed of an engine;

first means for receiving said input signal and developing a first spark timing digital output signal having a series of pulses synchronized with the input signal with pulse widths equal to an adjustable constant proportion of the period of the input signal;



second means for receiving said input signal and developing a second digital signal having a series of pulses synchronized with the input signal with predetermined pulse widths for a given engine condition, and

circuit means for combining the first and second digital signals to provide an electronic spark timing signal having second signal pulses which are each adjusted in time by amounts equal to the pulse widths of the first digital signal.

4,106,441

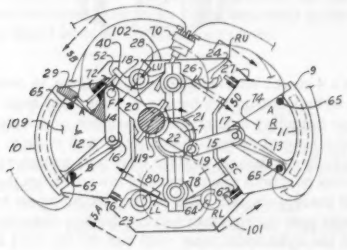
POWER TRANSLATION MACHINE WITH OSCILLATING PISTON

Thomas W. Anderson, 1209 Boxwood La., Apex, N.C. 27502

Filed Jan. 19, 1977, Ser. No. 760,749

Int. Cl.[2] F02B *53/00*

U.S. Cl. 123—18 R **3 Claims**



1. A machine for the translation of power between pressure within a confined space and rotation of a shaft comprising:

at least one enclosure defined by a sector of a cylinder with respect to a discrete first axis of a discrete length, and the sector dimension extending angularly 60° to 90°;

a first shaft concentric with said first axis, and a relatively flat piston journalled on said first shaft and positioned and configured to oscillate angularly within said enclosure over at least a portion of the angular displacement available in said enclosure, and forming on opposite sides of the piston the combination of progressively increasing and decreasing first and second cavities of confined spaced;

at least two valves, an intake valve and an exhaust valve, connected to at least one of said cavities, and including means for opening said intake valve during at least a portion of movement of said piston effecting an expansion of said one cavity, and opening said exhaust valve during at least a portion of movement of said piston, effecting a contraction in volume of said one cavity;

a first crank rigidly affixed about a first axis at one end to said first shaft and having a pivotal coupling about a second axis on said first crank at a point spaced on it from said first shaft;

a second shaft spaced from said first shaft and journalled for 360° rotation about a third axis parallel to said first shaft;

a second crank rigidly affixed at one end to said second shaft and having a pivotal coupling at a fourth axis on said second crank at a point spaced on it from said second shaft;

a linkage pivotally connecting between said pivotal couplings of said first and second cranks; and

said cranks and said linkage being of relative lengths, whereby said piston will move from one extreme position in said enclosure to an opposite extreme position in said enclosure during a 180° rotation of said second shaft, and wherein the angle T formed between a plane approximately corresponding to said flat piston and a line through said first and second axes is equal to $90° + (S/2) - [(S/2] - AA)$, where:

AA is the angle formed between a line passing through said first and third axes and a line extending through said third and fourth axes, and

S is an angle at least twice the magnitude of angle *AA*.

4,106,442

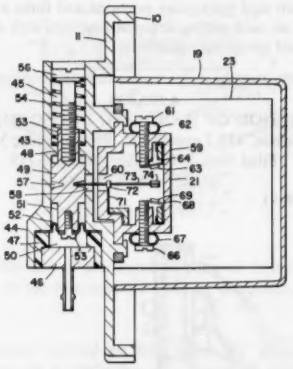
DEVICE FOR INCREASING FUEL ECONOMY OF AN INTERNAL COMBUSTION ENGINE

Albert J. Miller, Campbell, Calif., assignor to Engineering Systems Corporation, Santa Clara, Calif.

Filed Nov. 15, 1976, Ser. No. 742,004

Int. Cl.[2] F02M *23/04, 7/10*

U.S. Cl. 123—26 **13 Claims**



1. A device for improving the fuel economy of an internal combustion engine which includes an intake manifold supplying a combustible air-fuel mixture and an ignition system, comprising air filter means for providing clean, uncarbureted air, and means for introducing said uncarbureted air into said intake manifold when said engine is operating above a predetermined speed and is undergoing deacceleration or substantially open throttle full acceleration, said uncarbureted air inreasing the air-fuel ratio in said intake manifold and decreasing the rate of consumption of fuel; said last mentioned means including a vacuum sensing electrical switch connected to said intake manifold, said switch including switch contacts closable by high and low vacuum conditions in said intake manifold corresponding to said deacceleration and said full acceleration, respectively, of said engine; solenoid actuated valve means connected between air filter means and said intake manifold for selectively admitting said uncarbureted air into said intake

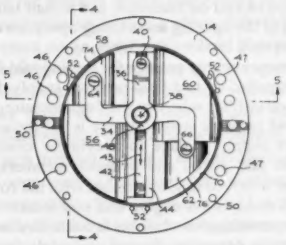
manifold; electronic circuit means connected to said ignition system for producing an actuating signal when said engine is operating above said predetermined speed, and electronic switching means connected to said solenoid actuated valve means and said switch contacts for operating said valve means when receiving said actuating signal and said switch contacts are closed.

4,106,443

ROTARY INTERNAL COMBUSTION ENGINE

Joseph P. Triulzi, 5931 Abernathy Dr., Los Angeles, Calif. 90045

Filed Oct. 12, 1976, Ser. No. 731,519
Int. Cl.[2] F02B *57/00*
U.S. Cl. 123—43 R **24 Claims**



1. A rotary internal combustion engine comprising:
a housing including a right circular cylindrical interior surface;
rotor means for providing rotary shaft power including a partially cylindrical exterior and a rotor adapted to rotate concentrically within, and about the axis of, the cylindrical interior surface, the rotor including at least a first cylinder block and a second cylinder block rotatably disposed about an axis of rotation coincident with an axis for the cylindrical interior surface;
cylinder means within each of said cylinder blocks defining a combustion chamber for receiving therein a longitudinally movable piston, a first piston in the first cylinder block and a second piston in the second cylinder block, the cylinder block and both ends of the associated piston being shaped to conform to the housing interior surface;
connecting means for rotatably connecting the first piston, the second piston and a first end of a crank; and
link means including the crank, for movably connecting the connecting means and the housing at a point offset from the axis for the cylindrical interior surface.

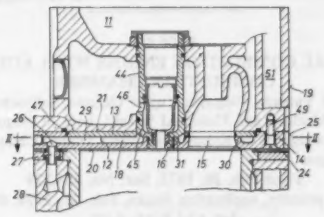
4,106,444

INDIVIDUAL CYLINDER HEAD

Herbert Deutschmann, and Karl Schier, both of Friedrichshafen, Germany, assignors to Motoren-und Turbinen-Union Friedrichshafen GmbH, Germany

Filed Mar. 31, 1976, Ser. No. 672,282
Claims priority, application Fed. Rep. of Germany, Apr. 3, 1975, 2514592
Int. Cl.[2] F02F *1/36*
U.S. Cl. 123—41.82 R **30 Claims**

1. A liquid-cooled cylinder head assembled of several parts for piston internal combustion engines having two inlet and outlet valves respectively arranged adjacent one another, the liquid-cooled cylinder head comprises a cast upper part and a double-walled bottom means between said upper part and a combustion space, said double-walled bottom means being provided with aperture means for valves and for one of an injection nozzle and a pre-chamber, and cooling liquid space means being formed in said double-walled bottom means, characterized in that the double-walled bottom means extends substantially over an entire lower surface of the cylinder head upper part essentially up to an outer boundary thereof, in that a lower surface of the upper part and upper and lower surfaces of the double-walled bottom means are constructed substantially planar, in that upper and lower wall portions of the double-walled bottom means are supported with respect to one



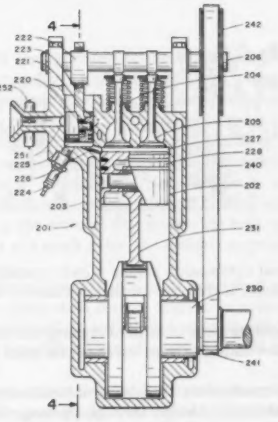
another by support means within an annular zone in an area of the support of the double-walled bottom means on a cylinder head seal, and in that several cooling medium inlet openings are distributed in the lower wall portion of the double-walled bottom means between the annular zone and an outer boundary of the double-walled bottom means.

4,106,445

RECIPROCATING PISTON MACHINE WITH COMPLETE COMBUSTION SYSTEM

John H. Beveridge, 177 Cornelio, San Clemente, Calif. 92672

Continuation of Ser. No. 389,277, Aug. 17, 1973, abandoned.
This application Oct. 14, 1975, Ser. No. 621,999
Int. Cl.[2] F02B *25/12, 17/00*
U.S. Cl. 123—53 A **6 Claims**



1. Apparatus of the class described comprising:
a block member;
at least one cylinder and a crankshaft rotatably mounted in said block member;
a piston reciprocable in said cylinder;
valving means for valving intake and exhaust from said one cylinder;
at least one auxiliary cylinder in said block member having a swept volume substantially smaller than said one cylinder;
a piston reciprocal in said auxiliary cylinder;
inlet ports in said auxiliary cylinder controlled by said auxiliary piston for charging the auxiliary cylinder;
ignition means in said auxiliary cylinder;
passage means communicating between said auxiliary cylin-

der and said one cylinder; and connecting means connecting said pistons to said crankshaft;

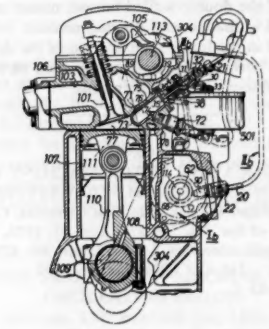
said crankshaft and connecting means providing a predetermined phase relationship between said auxiliary piston and said one piston whereby substantially all of the ignited charge is expelled into said one cylinder providing almost complete combustion in said one cylinder.

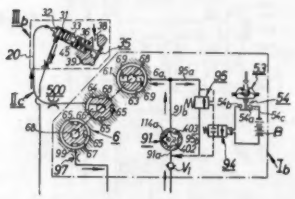
4,106,446

INTERNAL COMBUSTION ENGINE WITH AUXILIARY COMBUSTION CHAMBER

Masatoshi Yamada, Nagoya; Yujiro Oshima, Ichinomiya; Katsuhiko Hattori, and Hideyuki Suzuki, both of Nagoya, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Japan

Filed Feb. 28, 1975, Ser. No. 554,229
Claims priority, application Japan, Feb. 28, 1974, 49-23830
Int. Cl.[2] F01L 9/02
U.S. Cl. 123—90.13 **2 Claims**





1. An internal combustion engine which comprises:

a main combustion chamber for the combustion of an air fuel mixture;

means for operating the control of opening and closing of an intake valve and an exhaust valve of said main combustion chamber;

an auxiliary combustion chamber communicating with said main combustion chamber through a passage such that the ignition of an air-fuel mixture in said auxiliary combustion chamber induces ignition and combustion of the air-fuel mixture in said main combustion chamber;

an intake valve provided in said auxiliary combustion chamber for opening and closing a passage connected to a fuel supply means therefor;

an intake valve lifter having a piston member which is associated with said intake valve of said auxiliary combustion chamber and a cylinder member in which said piston member moves, said intake valve lifter further comprising an opening means provided in the side wall of said cylinder member thereof in communication with an oil reservoir and in a position corresponding to a predetermined piston stroke position, thereby to drain a predetermined amount of pressure fluid out of said cylinder member through said opening means on each compression stroke of said piston member;

a fluid pressure supply device driven by said internal combustion engine to supply a fluid pressure for operating the control of opening and closing of said intake valve of said auxiliary combustion chamber separately and independently of the operation of said valve operating means of said main combustion chamber, said fluid pressure supply device further comprising a hydraluic circuit having an unloading valve in communication with said fluid pressure supply passage and an oil reservoir and a detecting means operatively connected to said unloading valve for detecting particular driving conditions of said internal combustion engine, thereby to turn said unloading valve in a conductive condition upon detecting particular driving conditions of said internal combustion engine, to allow the fluid pressure supplied by said fluid pressure supply device to escape to said oil reservoir, and to halt temporarily the control of the opening and closing operation of said intake valve by said intake valve lifter;

a fluid pressure supply passage for feeding said fluid pressure being supplied by said fluid pressure supply device to said intake valve lifter whereby the fluid pressure generated by said fluid pressure supply device is fed through said fluid pressure supply passage to a cylinder chamber defined between said piston and cylinder members, said piston member is moved in synchronism with the rotation of said internal combustion engine and said intake valve of said auxiliary combustion chamber is controlled in the opening and closing operation thereof separately from and independently of the operation of said valve operating means of said main combustion chamber,

a rotary distributor valve means comprising a rotary member driven in synchronized relation with the rotation of said internal combustion engine and provided with a number of predetermined fluid passages therein; and a casing rotatably supporting said rotary member and having a number of fluid passages in predetermined position relative to said rotary member on a side wall thereof, whereby the fluid pressure supplied to said fluid pressure supply device is fed to each cylinder chamber defined between the piston and cylinder members of the respective intake valve lifters of a number of auxiliary combustion chambers, in accordance with a predetermined ignition order of the respective combustion chambers, through said fluid passages of said rotary member and casing of said rotary distribution valve means when said rotary member is rotated and said fluid passages of said rotary member are communicated with those of said casing, and said intake valves of the respective auxiliary combustion chambers are controlled to open and close in a predetermined order and wherein,

said fluid pressure supply device and said rotary distributing valve are integrally formed;

said fluid pressure supply device comprises a trochoidal pump comprising an inner rotor having a side wall of a trochoidal curve configuration driven by a drive shaft connected to a crankshaft of a four cylinder internal combustion engine by a timing chain mechanism and an outer rotor relatively rotatable to said inner rotor in a casing fixed integrally to a side wall of an engine block, a suction port of a valve plate of said trochoidal pump being connected to a gear pump of an engine lubricating pump through an oil filter and a check valve, a delivery port of a valve plate of said trochoidal pump being connected to a suction port of said pressure regulating valve, said pressure regulating valve comprising a cylinder, a valve seat formed in said cylinder, a hollow stepped piston having an orifice at the stepped part thereof and spring means reciprocatingly mounted in said cylinder, and a pressure regulator pilot means having a screw member provided in a casing, a valve member, spring means forcing said screw member and valve member, and a valve seat opposed to said valve member;

said rotary distributing valve means further comprises a cylinder fixed integrally to said side wall of said engine block on which an annular feeding groove is connected to said delivery port of said trochoidal pump, four distributing ports, having respectively a phase difference of 90°, each connected to four cylinders of said intake valve lifter and an annular discharging groove connected to said oil reservoir through a back pressure regulating restricted orifice, are respectively provided at a predetermined part of an inner wall thereof, and a distributing shaft, which is integrally connected to said drive shaft and has a bottom-closed axial inner cavity in an axial center thereof, a feeding passage extending radially therethrough, for distributing passages connecting said four distributing ports of said cylinder and said bottom-closed axial inner cavity in response to the rotation of said distributing shaft, and four discharging grooves having a phase difference of 90 degrees formed on an outer wall of said distributing shaft, said detecting means comprising a diaphragm type actuator having a first chamber with spring means connected to the intake manifold of said four cylinder engine and a second chamber connected to the atmosphere, divided by a diaphragm member, a switch element having a movable element connected to said diaphragm member, and a DC source connected to both terminals of said switch element;

said hydraulic circuit has an electromagnetic on-off valve as said unloading valve connected to said switch element of said detecting means which has one port communicated with a passage connecting said pressure regulating valve of said fluid pressure supply device and said check valve and the other part communicates with a vent pressure induction passage of said pressure regulating valve;

said intake valve lifter comprises four means corresponding to each of the cylinders of said four cylinder engine, each means comprising said cylinder member being integrally fixed to said cylinder head at a position according to each cylinder of said engine, said piston member interposed respectively in each of the bores of said cylinder member and connected through a rod member and spring means to said intake valve, the valve part of which is provided within a derby hat-shaped hollow member as said auxiliary combustion chamber having a spark plug, said intake valve reciprocably supported on the hollow cylindrical member having flange parts at both ends and a passage for cooling thereof, said flange parts integrally fixing said cylinder member and said derby hat-shaped member to said cylinder head, said hollow cylindrical member having a lower chamber connecting to a carburetor for said auxiliary combustion chamber through pipe means;

said fluid pressure supply passage comprises four steel pipes connected to said four distributing ports of said rotary distributing valve through a metal fitting and connecting to said four means of said intake valve lifter through metal fittings; and

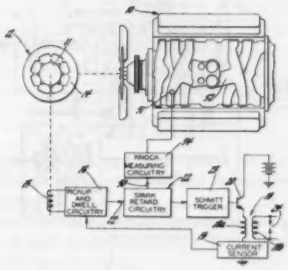
said opening means comprises an opening provided on each hollow cylindrical intermediate member which is interposed between said piston member and said cylinder bore of said cylinder member, said opening being connected to an oil pan as the oil reservoir through a throttle member disposed on the side wall of said cylinder member, metal fitting and a steel pipe, the position of said opening being decided in such a manner that the opening is normally closed when said piston member is not stroked and is opened to introduce the fluid pressure out of said cylinder member only when the piston is stroked.

4,106,447

ENGINE SPARK TIMING SYSTEM WITH RETARD MEANS AND MINIMUM BURN TIMER

Gene A. West, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 22, 1977, Ser. No. 789,801
Int. Cl.[2] F02P 5/04
U.S. Cl. 123—117 R **3 Claims**



1. A spark timing system for an internal combustion engine having a crankshaft, a plurality of spark plugs, a spark coil adapted to provide spark pulses to the spark plugs in predetermined order as the crankshaft rotates, means for providing an electric current through the spark coil including switch means responsive to a coil-on signal to switch on the electric current and thus cause a buildup of electromagnetic energy in the spark coil and further responsive to a coil-off signal to switch off current in the coil and thus release the built up electromagnetic energy as a spark pulse, the system comprising, in combination:

signal generating means timed to crankshaft rotation, shiftable in phase with respect thereto in accordance with a program based on engine operating conditions and effective to generate a train of alternating coil-on and coil-off signals;

first means responsive to the signal generating means to normally pass the coil-on signals directly to the switch means to switch on current in the spark coil immediately with each coil-on signal;

second means responsive to the signal generating means to pass the coil-off signals to the switch means after a retard varying with at least one additional engine operating condition to turn off current in the coil and generate a spark pulse with each coil-off signal after said retard; and

third means responsive to the second means to prevent the first means from passing the following coil-on signal to the switch means for a constant predetermined time, whereby the spark pulse is ensured a predetermined minimum burn time for good engine combustion, even at high engine speed when the next coil-on signal might occur before the retarded previous spark pulse.

4,106,448

INTERNAL COMBUSTION ENGINE AND METHOD OF OPERATION

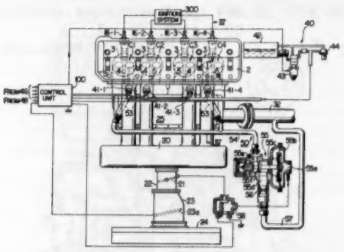
Masaaki Noguchi, Nagoya; Masaharu Sumiyoshi, Toyota; Yukiyasu Tanaka, Okazaki, and Taro Tanaka, Chiryu, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Feb. 11, 1976, Ser. No. 657,201

Claims priority, application Japan, Mar. 3, 1975, 50-26375; Mar. 10, 1975, 50-29232; Mar. 19, 1975, 50-33719; Apr. 2, 1975, 50-40709; Apr. 4, 1975, 50-41692; Apr. 14, 1975, 50-45685; Apr. 21, 1975, 50-47926; Apr. 25, 1975, 50-51047; May 9, 1975, 50-55781; May 15, 1975, 50-58234; May 21, 1975, 50-61223; Jun. 12, 1975, 50-71774; Jun. 12, 1975, 50-71778; Jun. 18, 1975, 50-74958; Jun. 28, 1975, 50-80419

Int. Cl.[2] F02M *7/00;* F02P *5/04;* F02B *19/10, 19/16*

U.S. Cl. 123—119 LR 254 Claims



1. A method of operating an internal combustion engine having a plurality of sequentially operative combustion chambers, comprising the steps of:

supplying to said combustion chambers a lean air-fuel charge having an air-fuel ratio larger than 16;

supplying additional fuel to at least one of said combustion chambers relative to the quantity of air sucked-in said at least one of said combustion chambers as the engine power demand increases, said additional fuel rendering the air-fuel charge in said at least one combustion chamber richer than approximately stoichiometric, selecting in a sequential firing of all of said combustion chambers the number of combustion operations at which the combustion of said richer air-fuel charge is made to meet said engine power demand; and

converging exhaust gases of said combustion chambers.

4,106,449

EGR SYSTEM

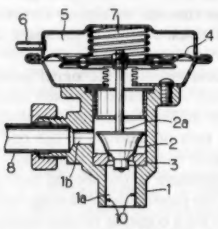
Noboru Matsumoto; Kunio Kurose, both of Toyota, and Kinya Ueno, Seto, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Nov. 15, 1976, Ser. No. 736,192

Claims priority, application Japan, Jan. 20, 1976, 51-5690

Int. Cl.[2] F02M *25/06*

U.S. Cl. 123—119 A 10 Claims



1. In an EGR system for diminishing the harmful substances contained in the exhaust gas from an internal combustion engine by recycling a portion of the exhaust gas into the gas in-take side of the engine, said EGR system comprising a valve body and an EGR cooler, the improvement wherein each is made of a casting of an aluminum alloy, with at least the portions of the inside thereof exposed to the exhaust gas being coated with means for improving the corrosion-resistance and function of the EGR valve, for eliminating pitting, and for inhibiting the sticking of solid particles thereto, said means comprising a PTFE coating having a layer thickness of 10 – 15 μ.

4,106,450

AIR-TO-FUEL RATIO FEEDBACK CONTROL SYSTEM

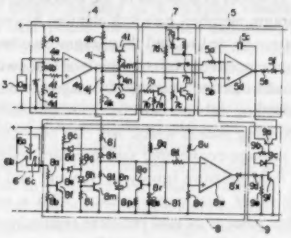
Hideaki Norimatsu; Mitsuo Nakamura, both of Kariya, and Nobuyuki Kobayashi, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Apr. 12, 1977, Ser. No. 786,898

Claims priority, application Japan, Jul. 2, 1976, 51-79096

Int. Cl.[2] F02B *33/00*

U.S. Cl. 123—119 EC 8 Claims



1. An air-to-fuel ratio feedback control system for internal combustion engines comprising:

an air-to-fuel ratio detector, positioned in an exhaust passage of an engine, for generating a detection signal indicative of the air-to-fuel ratio of air-fuel mixture supplied to said engine;

a discriminator, connected to said air-to-fuel ratio detector, for generating a discrimination signal which changes to high and low levels alternately in response to said detection signal;

an integrator, connected to said discriminator, for generating an integration signal the level of which increases or decreases in response to said discrimination signal;

a mixture controller, adapted to supply said engine with air-fuel mixture of air-to-fuel ratio which is preset to vary in accordance with engine operating conditions and connected to said integrator, for correcting said air-to-fuel ratio to a constant ratio which is substantially equal to the stoichiometric ratio in response to said integration signal;

a condition detector for generating a condition signal when the throttle valve of said engine is fully closed and when fully opened;

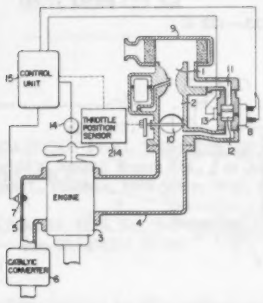
a monitor circuit, connected to said discriminator and said condition detector, for generating a monitor signal indicative of at least one of conditions in which an alternately changing interval of said discrimination signals exceeds a first predetermined interval and a generation interval of said condition signals exceeds a second predetermined interval longer than said first predetermined interval; and

a halt circuit, connected to said monitor circuit, for causing said integrator to maintain said integration signal to a constant level in response to said monitor signal, said constant level being predetermined to indicate that air-to-fuel ratio correction in said mixture controller is stopped.

4,106,451
AIR-FUEL RATIO ADJUSTING SYSTEM FOR INTERNAL COMBUSTION ENGINES

Tadashi Hattori, Okazaki; Akira Takata; Tamotsu Fukuda, both of Toyota, and Takamichi Nakase, Gamagori, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Mar. 30, 1977, Ser. No. 782,748
Claims priority, application Japan, Apr. 13, 1976, 51-42145; Apr. 13, 1976, 51-42147; Apr. 19, 1976, 51-44653
Int. Cl.[2] F02B *75/10*; F02M *7/00*; F02B *3/00*
U.S. Cl. 123—119 EC 6 Claims



1. In an air-fuel ratio adjusting system for an internal combustion engine including:

means communicated with an intake manifold of an internal combustion engine for producing and supplying to said engine air-fuel mixture;

a throttle valve disposed in said means for controlling the amount of said air-fuel mixture;

a bypass passage communicated with said intake manifold downstream of said throttle valve for supplying additional air therethrough;

a bypass valve operatively disposed in said bypass passage for controlling the opening area of said passage through which said additional air flows, whereby the amount of said additional air is controlled by said bypass valve;

an air-fuel ratio sensor disposed in an exhaust manifold of said engine for sensing the air-fuel ratio of the air-fuel mixture fed to said engine;

driving means operatively connected to said bypass valve for driving the same in a valve opening or closing direction; and

a control unit electrically connected to said air-fuel ratio sensor and driving means for actuating said driving means in accordance with the output from said air-fuel ratio sensor in order to adjust the air-fuel ratio of the mixture to be fed to said engine,

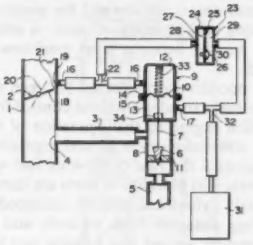
the improvement comprising:

a maximum opening detecting circuit electrically connected to said control unit for limiting a maximum opening of said bypass valve to a predetermined value depending on at least one of operating conditions of said engine, whereby effective operation for adjusting the air-fuel ratio can be obtained.

4,106,452
EXHAUST GAS RECIRCULATOR

Kohichi Mizutani, Seto, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 704,506, Jul. 12, 1976, abandoned. This application May 16, 1977, Ser. No. 797,607
Claims priority, application Japan, Mar. 11, 1976, 51-29250
Int. Cl.[2] F02M *25/06*
U.S. Cl. 123—119 A 3 Claims



1. An exhaust gas recirculation system for use in an engine provided with an intake manifold and throttle valve mounted therein comprising:

first conduit means for recirculating exhaust gas from said engine to said intake manifold at a position downstream from said throttle valve,

valve actuator means including a diaphram separating two pressure chambers,

valve means responsive to movement of said diaphram for opening and closing said first conduit means,

second conduit means coupling a first of said two pressure chambers with a port in said intake manifold located slightly upstream of an idle opening position of said throttle valve,

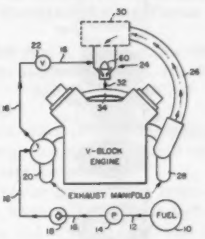
a negative pressure delaying valve, and

a third conduit means coupling the second of said two pressure chambers with said second conduit means through said negative pressure delaying valve.

4,106,453
APPARATUS AND PROCESS FOR IMPROVING FUEL EFFICIENCY OF AN INTERNAL COMBUSTION ENGINE UTILIZING A VAPOR STATE OF FUEL

Ernest G. Burley, R.D. 1, Watkins Glen, N.Y. 14891

Filed Aug. 2, 1976, Ser. No. 710,374
Int. Cl.[2] F02M *31/00*
U.S. Cl. 123—120 16 Claims



1. In an internal combustion engine of the type which includes (a) heating means for converting liquid fuel into vapor fuel and (b) a mixing chamber for combining a regulated fuel of the vapor fuel with a flow of air, the improvement in said mixing chamber comprising

a housing defining a mixing zone through which a regulated flow of vapor fuel is mixed with a turbulent flow of air to

produce a high efficiency fuel/air mixture, said housing having

a major inlet for admitting air to said mixing zone,

a plurality of ports for introducing fuel vapor into said mixing zone, and

a major outlet for discharging the fuel/air mixture to combustion zones of an associated internal combustion engine,

a regulating assembly contained within said housing for controlling the rate of flow of fuel vapor into the housing, said regulating assembly being fitted within said housing for relative movement thereto and for sequentially opening and closing said plurality of ports as said regulating assembly is moved between limit positions within the housing, and

linkage means operatively connected between said regulating assembly and a standard throttle control for said internal combustion engine so that operation of said throttle control will effect movement of said regulating assembly to thereby control the rate of flow of fuel vapor to the engine, wherein said plurality of ports are formed through portions of said cylindrical member intermediate its ends and at varying distances from its ends, and including a reservoir structure around said housing and in communication with said plurality of ports for containing a volume of fuel vapor for introduction into said housing, and

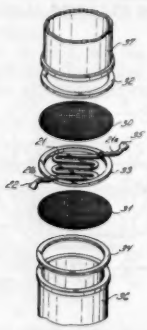
wherein said regulating assembly comprises a second cylindrical member fitted within the bore of said first cylindrical member for axial movement therein, said second cylindrical member having a number of openings formed therein which are equal in number to the number of said plurality of ports formed in the first cylindrical member, said openings being positioned and arranged to become sequentially aligned or misaligned with said ports in accordance with the axial positioning of said second cylindrical member within the first cylindrical member, said second cylindrical member being further provided with a longitudinal bore therethrough for admitting a flow of air through the regulating assembly.

4,106,454

APPARATUS FOR INCREASING THE EFFICIENCY OF INTERNAL COMBUSTION ENGINES

Lawrence Philip Henlis, Hawley, Pa., assignor to Harvey Jasper, Woodmere; Ezekiel Jasper and Harry Ball, both of Brooklyn, all of, N.Y., part interest to each

Filed Nov. 5, 1976, Ser. No. 738,998
Int. Cl.² F02M *31/00*
U.S. Cl. 123—122 F **4 Claims**



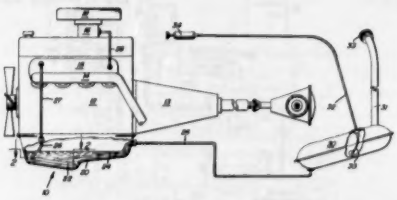
1. Apparatus for increasing the efficiency of combustion in an internal combustion engine having fuel atomizing means, an intake to the combustion chambers and a battery powered electrical ignition system including a distributor, comprising at least one screen inserted between the fuel atomizing means and the intake for contacting fuel which has been atomized by the fuel atomizing means, electrical means powered by the battery for heating the at least one screen sufficiently to vaporize atomized fuel coming in contact therewith and means for adjusting the power supplied to the heating means by the battery in response to the operating conditions of the engine, the adjusting means comprising means for comparing the voltage of electrical pulses from the distributor with the voltage of the battery and means for conducting the pulses to the heating means when the voltage thereof exceeds the voltage of the battery thereby to power the heating means, the output of the heating means being proportional to the power supplied thereto.

4,106,455

VAPORIZER SYSTEM FOR GASOLINE ENGINES

Robert Vance, Jr., 116 E. 25 St., Huntington Station, N.Y. 11746

Filed Jan. 6, 1977, Ser. No. 760,132
Int. Cl.² F02M *31/00*
U.S. Cl. 123—122 E **7 Claims**



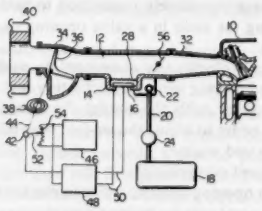
1. In combination with an internal combustion engine system, the engine provided with means for burning fuel therewithin, an exhaust system associated therewith, a fuel induction system, an oil lubricating system with engine oil sump, and a liquid fuel storage tank, the improvement comprising means for applying pressure to said storage tank, and further means for converting the liquid fuel to vapor form prior to feeding to the engine fuel induction system, the means for converting the liquid fuel to the vapor form including a heat exchange unit mounted in the engine oil sump for the purpose of absorbing heat from the engine oil when hot in order to vaporize the liquid fuel to a gas.

4,106,456

FUEL SUPPLY INSTALLATION FOR INTERNAL COMBUSTION ENGINES

Kazuo Shinoda, and Masanori Torii, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Aug. 17, 1976, Ser. No. 715,145
Claims priority, application Japan, Mar. 16, 1976, 51-027681
Int. Cl.² F02M *29/00*
U.S. Cl. 123—119 E **16 Claims**



1. A fuel supply installation for an internal combustion engine in which fluid fuel is atomized by ultrasonic vibrations, said engine including a throttle valve located in an intake air passage, comprising:

a fuel atomization pail containing said fluid fuel provided in said intake air passage of said engine, said atomization pail being open to said air passage;

an ultrasonic element provided in said fuel atomization pail, said ultrasonic element generating high frequency ultrasonic vibrations when supplied with electric power, at least a portion of said element being soaked in the fluid fuel in said atomization pail;

suction air measuring means located in said intake air passage and upstream of said throttle valve; and

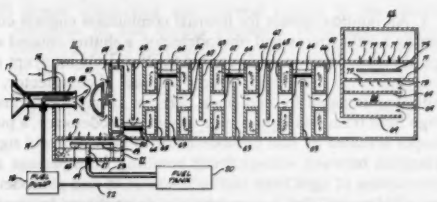
means coupled to said suction air measuring means and to said ultrasonic element for controlling the electric power supplied to said ultrasonic element so as to be proportional to the quantity of suction air, whereby a quantity of fluid fuel which is proportional to the quantity of suction air is atomized from said atomization pail and introduced into said engine.

4,106,457

DRY GASEOUS FUEL GENERATOR

George F. Totten, 4400 Smoke Ranch Rd., Las Vegas, Nev. 89108, and Wayne L. Harman, 5958 Pence Way, Las Vegas, Nev. 89119

Filed Nov. 18, 1976, Ser. No. 743,044
Int. Cl.² F02M *31/00*
U.S. Cl. 123—133 **15 Claims**



1. Apparatus for converting liquid fuel into a highly combustible dry gaseous fuel for an internal combustion engine, comprising:

a heated baffle chamber having two ends, and having a multiplicity of heated baffles therein forming a long tortuous path therethrough;

injector means connected through one end of said heated baffle chamber for receiving and converting liquid fuel into a fine spray of droplets;

intake means mounted in said one end of said heated baffle chamber for receiving and mixing air with said fine spray of droplets;

means for heating said multiplicity of heated baffles in said heated baffle chamber to substantially the exhaust temperature of an internal combustion engine whereby said mixture of air and fine spray of droplets are converted into a substantially dry gaseous fuel;

an unheated baffle chamber connected to the other end of said heated baffle chamber and having a labyrinth of unheated baffles therein adapted to intercept and to slow the flow of said substantially dry gaseous fuel and to remove therefrom any remaining fuel in liquid form; and

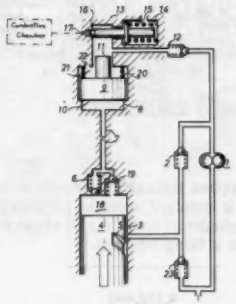
distribution means adapted to receive the dry gaseous fuel from said unheated baffle chamber and to controllably disperse said dry gaseous fuel into the intake manifold of an internal combustion engine wherein said dry gaseous fuel is combusted.

4,106,458

FUEL INJECTOR

Wolfgang Köhler, Cologne, Fed. Rep. of Germany, assignor to Klockner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed Apr. 14, 1977, Ser. No. 787,620
Claims priority, application Fed. Rep. of Germany, Apr. 23, 1976, 2617841
Int. Cl.² F02M *39/00*
U.S. Cl. 123—139 AT **2 Claims**



1. A fuel injector for internal combustion engines having a fuel tank, which comprises: fuel pumping means in communication with said fuel tank; fuel injection pumping means in communication with said fuel pumping means; volume governing means associated with said fuel injection pumping means; fuel injection valve means in communication with said fuel pumping means and said fuel injection pumping means; differential piston means interposed between and in communication with said fuel injection pumping means and said fuel injection valve means, said differential piston means having a first larger end face which is in communication with said fuel pumping means, and a second smaller end face which is in communication with said fuel pumping means; first check valve means interposed between said fuel injection valve means and said fuel pumping means; second check valve means interposed between said fuel pumping means and said fuel injection pumping means for limiting the feed pressure of said fuel pumping means; and pressure valve means interposed between said fuel injection pumping means and said fuel tank for determining the fuel pressure ahead of said fuel injection pumping means.

4,106,459

ULTRASONIC WAVE CARBURETOR

Kiyokazu Asai, and Akihiro Takeuchi, both of Nagoya, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Japan

Filed Jun. 3, 1976, Ser. No. 692,349
Claims priority, application Japan, Jun. 3, 1975, 50-67298
Int. Cl.² F02M *27/08*
U.S. Cl. 123—141 **41 Claims**

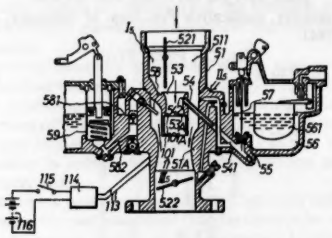
1. An ultrasonic wave carburetor comprising:

an intake passage for admitting fresh air and supplying an air-fuel mixture therethrough;

a fuel supply device comprising a reservoir which reserves fuel therein, a venturi provided in said intake passage, and a nozzle, one end of which opens into said venturi and the other end of which is communicated with said reservoir; and

a fuel atomizing device comprising an ultrasonic transducer connected to an ultrasonic wave oscillator for transforming an electrical oscillation into a mechanical vibration, a mechanical vibration amplifying member secured to said ultrasonic transducer for amplifying said mechanical vibrations, and an ultrasonic vibratory member, having a

hollow cylindrical body, which is positioned downstream of said venturi within said intake passage, with its outer peripheral surface integrally secured to said mechanical vibration amplifying member,



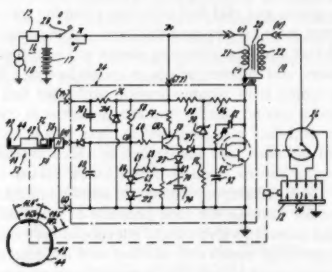
whereby fuel supplied through said nozzle in said fuel supplying device is atomized upon the peripheral surfaces of said hollow cylindrical body of said ultrasonic vibratory member which is being vibrated.

4,106,460

HALL EFFECT ELECTRONIC IGNITION CONTROL UNIT WITH AUTOMATIC SHUT-DOWN TIMER

Joseph J. Kopera, Trenton, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Nov. 18, 1976, Ser. No. 743,021
Int. Cl.[2] F02P *9/00*
U.S. Cl. 123—146.5 D **21 Claims**



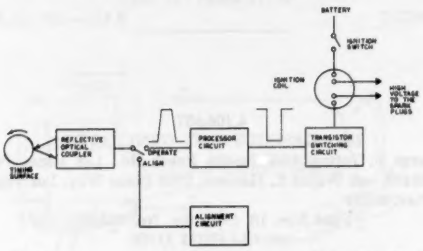
1. A triggerable electronic control unit apparatus for controlling the energization of the ignition coil of an inductive-type ignition system from a source of low tension energy to apply high tension energy to a sparking device of an internal combustion engine upon triggering of said control unit from a trigger device driven in synchronism with the engine; said control unit comprising a controllable semiconductor power switching device adapted to be connected in series with the ignition coil directly across said source when the power switching device is conductive; a control transistor having collector, base and emitter electrodes coupled in conductivity controlling relation with said power switching device and triggerable between a conducting and a non-conducting state by said trigger device; and time delay control switch means connected to the control transistor and operative to change the state of conduction thereof and render said power switching device non-conductive when the control transistor remains in a state of conduction which renders the power switching device conductive for a period of time greater than the dwell period of the ignition cycle at engine cranking speeds, said time delay control switch means including a timing capacitor coupled to the collector electrode of said control transistor to be rapidly charged from said source when the control transistor is non-conductive, a discharge resistor connected in parallel with said timing capacitor to be slowly discharged when said control transistor is rendered conductive, and a third controllable semiconductor switching device having a pair of output electrodes connected in a circuit across the input circuit of said control transistor and a control electrode coupled to the timing capacitor, whereby said time delay switch means renders said control transistor non-conductive to shut off the power switching device and stop current flow through the ignition coil if the control transistor and power switching device remain on for a period of time greater than the dwell period of the ignition cycle at engine cranking speeds.

4,106,461

REFLECTIVE IGNITION TIMING PROCESS

Sebastian Louis Giannini, 1363 Teakwood Dr., San Jose, Calif. 95128

Filed Feb. 25, 1976, Ser. No. 661,288
Int. Cl.[2] F02P *1/00*
U.S. Cl. 123—148 E **4 Claims**



1. An ignition system for internal combustion engines comprising a light source and photodetector, a shutter rotated at a speed proportional to engine speed to alternately interrupt and pass light from said light source to said photodetector, an indicator actuated by said photodetector to preoperationally align light from said light source to said photodetector, a pulse shaper actuated by said photodetector to provide rapid signal transition between voltage levels resulting from passage and interruption of light from said light source to said photodetector, a pulse amplifier actuated by said pulse shaper to provide switching of current through the ignition coil, said lightsource being a light emitting diode and said photodetector being a phototransistor each integrally mounted and geometrically related whereby light from said light source to said phototransistor has a predetermined focal distance from the said interrupter, said interrupter consisting of a cylindrical sleeve with alternate reflective and light absorbing areas corresponding to the timing requirements of the engine, said pulse shaper being a regenerative comparator with switchable inputs to produce outputs in phase or opposite in phase to input to drive an electronically switched inductive ignition output stage or capacitive discharge ignition output stage to the ignition coil.

4,106,462

IGNITION SYSTEM CONTROL CIRCUIT

Herbert J. Hildebrandt, Baldwinsville, and Donald W. Perkins, De Witt, both of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Mar. 18, 1976, Ser. No. 668,052
Int. Cl.[2] F02P *3/04*
U.S. Cl. 123—148 E **5 Claims**

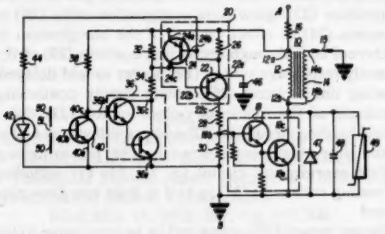
1. An ignition control circuit for providing the supply current switching function for the high voltage generating coil in an internal combustion engine ignition system including such coil and a power supply therefor, said ignition control circuit comprising:

(a) means for developing a control input signal representative of the crankshaft angle of the internal combustion

engine with which said ignition control circuit is to function;

(b) an input transistor switching amplifier having said control input signal applied thereto and being responsive to such signal to switch its conductivity state;

(c) an output transistor switching amplifier connected to complete a circuit between said high voltage generating coil and said power supply when conducting and to break such circuit when not conducting, said output amplifier including a control electrode to which an applied bias current is effective to control the completion of said circuit and the magnitude of current flow therein in accordance with the bias current;



(d) a constant current source including a current regulating circuit providing current output at a constant level;

(e) means connecting said input transistor switching amplifier to said current source for turning the current source on and off in accordance with the conductivity state of the input amplifier; and

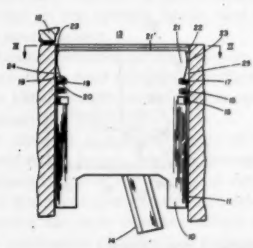
(f) means connecting said current source to the control electrode of said output transistor switching amplifier control to apply the constant current output of said source to said electrode as the operating bias for said output switching amplifier thereby to control current flow to said high voltage generating coil from said power supply.

4,106,463

DOUBLE TAPER PISTON

John Markley Curtis, Jr., Baltimore, and Paul Roberts Shepler, Towson, both of Md., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Filed Jan. 31, 1977, Ser. No. 763,935
Int. Cl.² F02F *3/00*
U.S. Cl. 123—193 P **7 Claims**



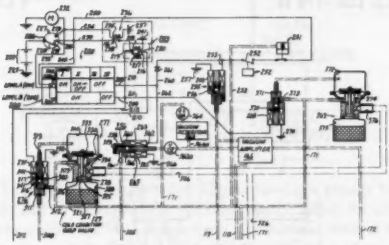
1. An improved piston for internal combustion engines of the type containing a skirt, upper, compression ring and a combustion head wherein the improvement comprises a top land above the compression ring having a zoned diameter wherein the largest diameter zone of the top land is disposed between lesser diameter zones of said land, said lesser diameter zones terminating adjacent the upper compression ring and combustion head respectively.

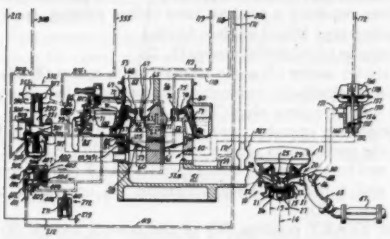
4,106,464

PROGRAMMED CONTROL SYSTEM FOR A LEAN-BURNING INTERNAL COMBUSTION ENGINE

Ryuichi Yamashita; Hiromitsu Matsumoto, both of Hamamatsu, and Masato Eda, Iwata, all of Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Aug. 24, 1976, Ser. No. 717,365
Int. Cl.² F02N *17/00*; F02M *23/04, 37/00*
U.S. Cl. 123—179 A **22 Claims**





1. In a carburetion system for an internal combustion engine which includes a principal carburetor, a starter carburetor, and an air gulp valve, which carburetors discharge a mixture of air and fuel into induction means, the induction means including a throttle valve whereby an induction pressure is established at a downstream location from the throttle valve that is respective to engine operating conditions, the starter carburetor including a fuel chamber containing fuel overlaid by a region having limited communication with the atmosphere, balance passage means interconnecting the said downstream location to the region, the gulp valve comprising gulp valve means operable to atmosphere, and gulp passage means connecting the said gulp valve means to the said downstream location, the improvement comprising:

balance passage valve means in said balance passage means effective to permit or to prevent air flow through said balance passage means;

balance passage valve actuator means operably connected to said balance passage valve means adapted to set the said balance passage valve means to permit or to prevent said air flow;

gulp valve actuator means operably connected to said gulp valve to prevent or to enable flow of air from atmosphere through the gulp valve to said gulp passage means; and

delay means operatively connected to both of said actuator means causing both of said actuator means to prevent said flows until after a predetermined period of time has elapsed following catching of the engine after cranking.

4,106,465
OFF-ON-START SWITCHING SYSTEM FOR DIESEL ENGINES, AND PARTICULARLY AUTOMOTIVE-TYPE DIESEL ENGINES

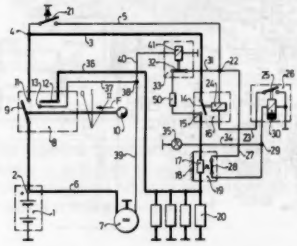
Walter Bernhardt, Fellbach, and Bodo Ziegler, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 16, 1977, Ser. No. 796,994

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1976, 2624685

Int. Cl.[2] F02N *17/00*

U.S. Cl. 123—179 H **9 Claims**



1. Electrical ON-OFF-START operating control system for engines requiring a pre-heat time before starting, such as automotive-type Diesel engines having

a source of electrical power (**1, 2**);

a starter motor (**7**) and a starter switch means (**8, 13**) therefor, selectively connecting the motor to the source;

at least one glow plug (**20**);

a manually operable control switch (**8, 9, 11, 12, 13**) having the positions, in sequence: OFF (**0**); ON (I); START (II); and corresponding ON (**11**) and START (**12, 13**) terminals and a movable switch member (**9**) connected to said source (**1**);

the START position (II) of the control switch (**8**) being unstable and including means (F) biassing the switch to return to the ON position (I) upon release of manual operation to START position, and after having moved the switch through the ON position to the START position;

a glow plug energization relay (**16**);

a delayed operating timer circuit (**26**);

two energization circuits (**3, 14, 15, 17; 36**) for said at least one glow plug (**20**),

a first one (**3, 14, 15, 17**) of said energization circuits including

a heating element — temperature sensitive thermally responsive switch (**19**) having a heating resistance (**17**) and thermally responsive switch contacts (**28**) in heat transfer relation to said heating resistance (**17**), the heating resistance being serially connected with said at least one glow plug (**20**), the switch contacts (**28**) opening when the switch is heated due to current flow through said heating resistance (**17**),

and the contacts of the glow plug energization relay (**16**);

the second one (**36**) of said energization circuits being directly connected to the START position (II) of said control switch (**8**) to apply direct power from said source (**1**) through said switch (**8**) to the at least one glow plug (**20**) while bypassing said heating resistance (**17**);

a glow plug control circuit (**5**) for said first glow plug energization circuit (**3, 14, 15, 17**), connected to the ON terminal (**11**) of the switch (**8**) and including

a momentary-close plug pre-heat switch (**21**),

a first junction (**22**),

the control means (**24**) for said glow plug energization relay (**16**),

and the contacts (**25**) of said delayed-opening timer circuit (**26**);

a controllable self-holding circuit (**50, 32**) connected to said junction (**22**) and including a controlled circuit breaking device (**33**);

a control connection (**37-38-40**) from the START position (II) of said switch (**8**) to the controlled circuit breaking device (**33**) of the self-holding circuit (**50, 32**) to open the self-holding circuit when the switch (**8**) is moved to tce START position (II);

a glow plug ready circuit (**27, 28, 29, 26, 30**) additionally connected to said first junction (**22**), said glow plug ready circuit including

the switch contacts (**28**) of said thermally responsive switch (**19**) and the time control element (**30**) of the delayed operating timer circuit providing, when the switch (**8**) is placed in the ON position (I) and the momentary-close plug pre-heat switch (**21**) is operated, power to said first junction (**22**), glow plug energization relay (**16**) control means (**24**) to effect closing of the energization contact thereof and, through the switch contacts (**28**) of the thermally responsive switch (**19**) power to said delayed operating timer circuit (**26**), power supply continuing after release of the momentary-close switch (**21**) due to the self-holding circuit (**50, 32**) and providing, upon closing of the glow plug energization relay (**16**) power through said first energization circuit (**3, 14, 15, 17**) including said heating resistance (**17**) to said at least one glow plug (**20**); and

indicator means (**35**) connected to be responsive to the state of the switch contacts (**28**) of the thermally responsive switch (**19**) and indicating when, after heating of the thermally responsive switch by current flowing through the heating resistance (**17**) thereof, a predetermined temperature has been reached to effect change-over of said thermally responsive contacts (**28**), change-over of said contacts interrupting energization of said timing circuit and initiating a timing delay interval to retain said first glow plug energization circuit in energized condition for the duration of the delay timing interval and permitting moving the switch (**8**) during said delay interval to the START position (II), but disconnecting the first glow plug energization circuit upon lapse of said delay timing interval.

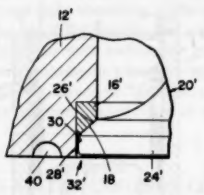
4,106,466
ENGINE VALVE WITH RECESSED SEAT AND ANNULAR GROOVE

Alexander Goloff, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 16, 1976, Ser. No. 714,449

Int. Cl.[2] F01L *3/00*

U.S. Cl. 123—188 S **7 Claims**



1. Valve apparatus comprising:

main body means;

a valve member movably mounted to said main body means so as to be reciprocable relative thereto, and comprising a valve stem and a valve head;

the main body means defining a seat portion against which said valve head may seat, the valve member being movable relative to the main body means to move the valve head away from the seat portion;

the main body means defining a bore adjacent the seat portion, the outer periphery of the valve head positioned in

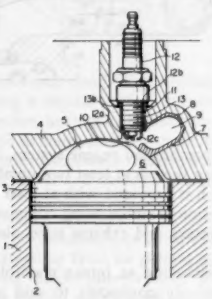
close proximity to the surface of the bore as the valve head is moved from the seat portion, so that the valve member and main body means maintain an effectively closed valve state as the valve head is removed from the seat portion, until the outer periphery of the valve head is moved from within the bore, wherein the bore is a cylindrical bore, and wherein the main body means define an annular groove located about the bore, the axis of the groove being substantially coincident with the cylinder axis of the cylindrical bore and wherein the annular groove is substantially semi-circular in cross-section.

4,106,467

INTERNAL COMBUSTION ENGINE WITH A SUBSIDIARY COMBUSTION CHAMBER

Toshio Tanahashi, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed May 19, 1976, Ser. No. 687,760
Claims priority, application Japan, Sep. 30, 1975, 50-117186
Int. Cl.[2] F02B *19/16*
U.S. Cl. 123—191 SP **4 Claims**



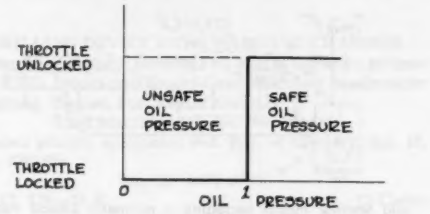
1. An internal combustion engine with a subsidiary combustion chamber, said engine comprising:
   - a cylinder block;
   - a piston reciprocally disposed in said cylinder block;
   - a cylinder head on the cylinder block, said cylinder head having an inner surface;
   - a main combustion chamber defined between the inner surface of the cylinder head and the top surface of the piston; said cylinder head having a recess therein opening into the main combustion chamber;
   - a subsidiary chamber component made of heat resistant material said recess having a mouth through which all of said subsidiary chamber will pass, said component being press-fitted into said recess through said mouth, said component having an inner chamber which comprises the subsidiary combustion chamber and a connecting passage which connects the main combustion chamber with the subsidiary combustion chamber;
   - a spark plug;
   - a first hole defined in the cylinder head;
   - a second hole defined in the subsidiary chamber component and aligned with the first hole; and
   - a flanged sleeve rigidly fixed into the first and second holes so as to prevent dislodging of the subsidiary chamber component from the recess, said sleeve having a threaded hole in which the spark plug is positioned.

4,106,468

PRESSURE RATIO VALVE

Bill G. Davis, Phoenix, Ariz., assignor to Jetco, Inc., Phoenix, Ariz.

Filed Mar. 18, 1977, Ser. No. 778,852
Int. Cl.[2] F01M *1/00*
U.S. Cl. 123—196 S **10 Claims**



1. In an internal combustion engine having a pressurized air supply and an air actuatable throttle control means for controlling the engine RPM in response to a pneumatic control signal, a pressure ratio valve for comparing the pressures of an engine fluid having a predetermined normal operating pressure and the air supply and for generating the pneumatic control signal in response thereto, said valve comprising in combination:
   - a. a body having a cylindrical bore including first and second bore sections;
   - b. a fluid pressure port communicating with said first bore section for connection to the engine fluid having a predetermined normal operating pressure;
   - c. an air pressure port communicating with said second bore section for connection to the pressurized air supply;
   - d. a control port communicating with said second bore section for transmitting the pneumatic control signal from said valve to the throttle control means;
   - e. an exhaust port communicating with said first bore section;
   - f. a piston slidably positioned in said bore between a first position and a second position, said piston including
     1. a first pressure receiving head on one end of said piston, positioned in said first bore section for receiving pressure from said engine fluid;
     2. a second pressure receiving head, on the opposite end of said piston, positioned in said second bore section for receiving pressure from said air supply, said second pressure receiving head opening a path between said air pressure port and said control port when said piston is in the second position and for closing the path between said air pressure port and said control port when said piston is in the first position; and
     3. a third pressure receiving head positioned intermediate said first and second pressure receiving heads for permitting air to flow from said control port to said exhaust port when said piston is in the first position and for preventing air flow between said control port and said exhaust port when said piston is in the second position;

whereby said piston is urged into the first position when the fluid pressure-air pressure ratio decreases below a predetermined magnitude for actuating the throttle control means to control the engine RPM.

4,106,469

AUTOMATIC MOTOR KILL SYSTEM

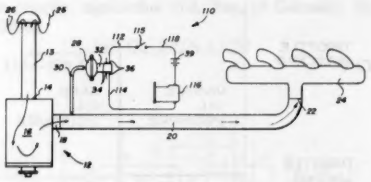
James Dey, 1101 Woodlark, Tyler, Tex. 75701

Division of Ser. No. 595,804, Jul. 14, 1975, Pat. No. 4,029,073.
This application Jan. 14, 1977, Ser. No. 759,780
Int. Cl.[2] F02B *77/00*
U.S. Cl. 123—198 DB **5 Claims**

1. An automatic engine shut off system for an internal combustion engine having an air cleaning system connected by a pipe to the intake manifold of the engine comprising:

means for sensing a pressure decrease to a predetermined level in the air cleaning connection pipe resulting from an obstruction of the air cleaning system,

means responsive to said sensing means for automatically shutting off the engine before damage occurs to the engine due to the obstruction of the air cleaning system, and



said sensing means including a normally closed vacuum switch responsive to the pressure level within the air cleaning connection pipe, whereby said vacuum switch opens in response to a decrease in the pressure level to a predetermined level.

4,106,470

SAFETY APPARATUS FOR STOPPING AN INTERNAL COMBUSTION ENGINE IN RESPONSE TO IRREGULARITIES OCCUR IN THE OIL PRESSURE OR IN THE WATER TEMPERATURE

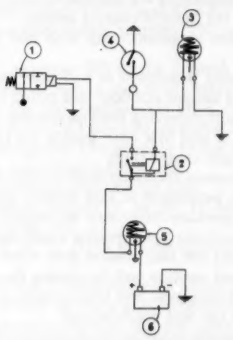
Jose Maria San Sebastian Saizar, c/Elcano, No. 15, Irun (Guipuzcoa), Spain

Filed May 25, 1976, Ser. No. 689,832

Claims priority, application Spain, May 28, 1975, 437.992

Int. Cl.[2] F02B *77/08*

U.S. Cl. 123—198 DB **1 Claim**



1. A safety apparatus for causing an internal combustion engine to stop automatically when irregularities occur in the oil pressure or in the water temperature, said apparatus comprising

an oil-pressure-actuated switch having normally closed contacts which are held open when an oil pressure of the engine is above a minimum value,

a water-temperature-actuated switch having normally open contacts which are closed when the temperature of a cooling liquid for the engine reaches a high temperature,

an electrical relay having an armature winding and a pair of normally open contacts which are closed by energization of the armature winding,

said oil-pressure-actuated switch and said water-temperature-actuated switch being connected in parallel to one side of the armature winding for controlling energization of the relay,

a normally open electrically operated valve connected in series with a fuel line to the engine,

said valve being electrically connected in series with the relay contacts,

a manual switch which is normally closed connected in series with the relay contacts and the electrically operated valve for disabling the operation of the valve to allow the engine to be started, and

said manual switch being free of any starter circuit so that the engine can be started and operated in the event of an irregularity when the manual switch is opened.

4,106,471

INTERNAL COMBUSTION ENGINE SYSTEM WITH AN AIR-FUEL MIXTURE SHUT OFF MEANS

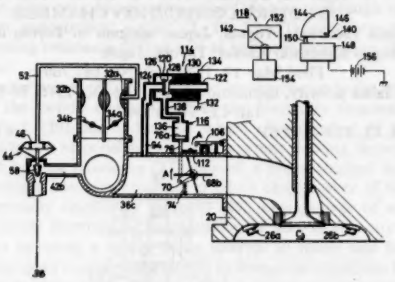
Yasuo Nakajima, Yokosuka, and Yoshimasa Hayashi, Yokohama, both of Japan, assignors to Nissan Motor Company, Ltd., Japan

Filed Jun. 23, 1976, Ser. No. 698,880

Claims priority, application Japan, Jun. 24, 1975, 50-78354

Int. Cl.[2] F02D *13/06*

U.S. Cl. 123—198 F **12 Claims**



1. An internal combustion engine system, comprising:

an engine having therein at least two combustion chambers each of which is provided with at least two spark plugs, each combustion chamber being communicable with corresponding intake and exhaust ports also formed in said engine;

intake means including an intake manifold having branch tubes respectively connected to said intake ports, and air-fuel mixture supply means located upstream of said intake manifold for supplying the air-fuel mixture to said combustion chambers through said branch tubes and said intake ports;

exhaust means communicating with said exhaust ports for collecting the high temperature spent gases from said exhaust ports and carrying them to an exhaust tube from which said spent gases are discharged to the atmosphere;

exhaust gas recirculating means for feeding a portion of the exhaust gases in said exhaust means into said intake means; and

air-fuel mixture shut off means for blocking the air-fuel mixture supply into selected at least one of said combustion chambers when said engine is subjected to deceleration, said air-fuel mixture shut off means including:

at least one damper swingably disposed in the branch tube corresponding to said selected combustion chamber for selectively closing and opening the passage of said branch tube;

biasing means for biasing said damper in a direction to open said passage of the selected branch tube;

a vacuum motor means for moving said damper in a direction to close the passage of the selected branch tube against the counterforce of said biasing means when a predetermined degree of vacuum is applied thereto; and

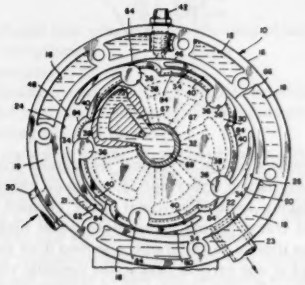
a three-way solenoid valve means having first, second and third tubes which are respectively communicated with the atmosphere, the interior of the selected branch tube upstream of said damper, and said vacuum motor means and

functioning such that when it is electrically energized, a fluid communication between said second and third tubes is accomplished and simultaneously a communication between said first and third tubes is blocked, and when it is de-energized, the communication between said second and third tubes is blocked and simultaneously the communication between said first and third tubes is accomplished.

4,106,472
ROTARY ENERGY CONVERTER WITH RESPIRING CHAMBERS

Glenn Rusk, 396 Bleecker St., New York, N.Y. 10014

Filed Nov. 8, 1976, Ser. No. 740,028
Int. Cl.[2] F02B *55/14, 53/10, 53/02;* F01C *19/00*
U.S. Cl. 123—205 30 Claims



1. An energy converter comprising a hollow housing having end walls enclosing a central section constituting a stator,

said central section having a chamber therein of generally circular shape defining an inner stator wall,

a cylindrical rotor mounted for rotation about an axis central within said chamber and having a generally circular outer surface,

a plurality of vanes pivotally mounted at equallyspaced points about the circumference of said rotor, with each of said vanes extending from its pivotal mount in the same direction along the periphery of said rotor,

said rotor being formed with spaced troughs underlying the respective vanes, each trough being sized to receive the overlying vane in a retracted position therein with the vane outer surface recessed within the outer surface of the rotor,

said inner stator wall being formed with at least one arcuate vaulted bay of greater radius from the center of said rotor than the basic circular extent of said stator wall, and at least one abutment station continuous with said bay,

said abutment station constituting a location on said stator inner wall of minimal radial distance from the rotor axis, and being positioned to depress said vanes into retracted position within said troughs as said vanes travel past said abutment station,

said vaulted arcuate bay enabling said vanes to pivot outwardly under the centrifugal force of the rotating vanes from their retracted positions to extended angular positions with the outer vane surfaces in engagement with the surfaces of said bay,

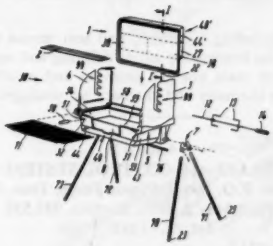
each pair of adjacent vanes forming therebetween a travelling chamber, the volume of which increases and decreases as said vanes move between their extended and retracted positions as said rotor turns within said stator, the outer surface of each vane being formed as a compound curve with each engaging area of the vane outer surface of lesser radius than the radius of the stator inner wall which it engages, whereby the vane outer surface is compatible with all surfaces of the stator inner wall,

each of said vanes engaging the surface of said bay at a sealing line which migrates from the journal end portion of said vane to the tip end portion thereof during the travel of said vane along said bay, whereby to provide a constant seal at the trailing end of one travelling chamber and the leading end of the succeeding travelling chamber, said vanes providing the only seals between adjacent chambers.

4,106,473
GRILLING DEVICE WITH WARMING CHAMBER

Stephan H. A. Wandel, Bremen, Fed. Rep. of Germany, assignor to EWG Import-und Export-Gesellschaft mit beschrankter Haftung, Bremen, Fed. Rep. of Germany

Filed Mar. 24, 1977, Ser. No. 780,696
Claims priority, application Fed. Rep. of Germany, Jan. 15, 1977, 2701552
Int. Cl.[2] A47J *37/00*
U.S. Cl. 126—25 R 12 Claims



1. A grill having a front and a rear, said grill comprising

a cast firebox having a bottom wall and upwardly extending side walls;

a grid extending in a horizontal plane between said upwardly extending side walls;

a grease-drip pan extending vertically upwardly between the rear edges of said side walls;

a shallow warming chamber disposed beneath said firebox, said warming chamber including side walls and a bottom wall in heat-conducting relationship with said firebox, the bottom wall of said firebox forming the top wall of said warming chamber;

said warming chamber including an opening at the front portion of said grill to allow the insertion of at least one heat-conducting flat plate for heating and warming;

legs for supporting said grill;

means interconnecting said legs and said grill for supporting said firebox in a horizontal plane and in a vertical plane;

said warming chamber opening being disposed upwardly when said firebox is in said vertical plane.

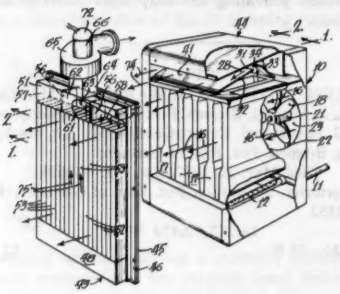
4,106,474
HEAT CONSERVING SPACE HEATER

Robert L. Hunter, and Everett L. Sartain, both of Racine, Wis., assignors to Modine Manufacturing Company, Racine, Wis.

Filed Mar. 17, 1977, Ser. No. 778,367
Int. Cl.[2] F24H *3/100*
U.S. Cl. 126—110 R 5 Claims

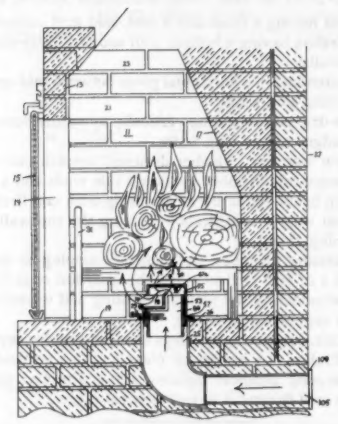
1. A heat conserving space heater, comprising: (A) a gas fired unit heater having a heat source means for providing a supply of hot gas, main hot gas passages leading from said source, and main air passages leading from and exhausting into the space being heated and in heat exchange relationship with said main hot gas passages; and (B) an auxiliary add-on heat conserving heat exchanger unit attached to said unit heater and having in heat exchange relationship with each other a set of auxiliary hot gas passages receiving hot gas from said main hot gas passages and a set of auxiliary air passages receiving heated air from said main passages, and an exhaust blower on said

add-on unit for drawing said hot gas through said main hot gas passages on the unit heater, then through said auxiliary hot gas passages of said add-on unit and then for exhausting said hot gases from said auxiliary passages to a place of disposal, said



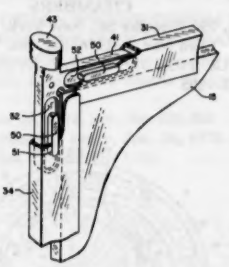
unit heater including a cabinet, and seal means between the unit and add-on heaters for aid in defining and separating the combination of main hot gas passages and auxiliary hot gas passages from the main and auxiliary air passages.

4,106,475
DRAFT AIR CONTROL SYSTEM
Clell C. Mayes, P.O. Box 8, Pigeon Forge, Tenn. 37863
Filed May 2, 1977, Ser. No. 792,536
Int. Cl.[2] F24B *7/02*
U.S. Cl. 126—121 **5 Claims**



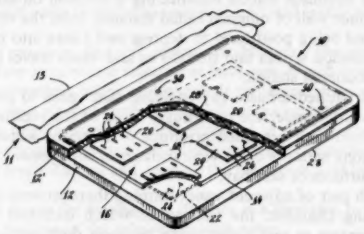
1. In a fireplace comprising a floor, a rear wall, a pair of oppositely disposed side walls, and grate means including a bottom side disposed above said floor, the combination of a duct having an outside end in fluid communication with a source of outside air and terminating at its inside end at a location below said grate means, damper means adjustably controlling the cross-sectional area of said duct, hood means covering said inside terminal end of said duct, said hood means including a throat section defining a first passageway in fluid communication with said inside terminal end of said duct, a lateral section defining a cover for said throat section and further defining a second passageway in fluid communication with said first passageway and directing the flow of fluid from said first passageway to a substantially non-vertical flow direction, said lateral section further defining a downwardly opening outlet thereby permitting essentially unrestricted air flow from said duct into said fireplace and essentially preventing passage of particulate matter into said duct while simultaneously distributing said outside air laterally beneath said grate.

4,106,476
DOOR FOR FIREPLACE SCREEN
Robert W. Harsha, Oregon City, Oreg., assignor to Pacific Fireplace Furnishings, Inc., Portland, Oreg.
Filed Jun. 28, 1976, Ser. No. 700,524
Int. Cl.[2] F24C *15/04*
U.S. Cl. 126—140 **4 Claims**



4. In a fireplace screen, a vertical rectangular frame having a downwardly facing upper horizontal guide channel and an upwardly facing lower horizontal guide channel, a folding door in said frame having a first door panel hinged at one vertical edge thereof to said frame, a second door panel in said frame hinged at one vertical edge to the opposite vertical edge of said first panel, and vertical upper and lower guide posts on the opposite vertical edge of said second panel slidable and rotatable in said guide channels when the door is opened and closed, said guide posts being elliptical with the major axis of the ellipse perpendicular to said second panel, said major axis of the ellipse for each guide post being transverse to its guide channel when the door is closed, to position said opposite edge of said second panel, and said major axis rotating into alignment with the guide channel when the door is folded to open position to allow the lower guide post to pass by fine debris in said lower guide channel.

4,106,477
THERAPEUTIC SELF-GENERATING MOIST HEAT PAD
Sheldon L. Feld, Jamaica, N.Y., assignor to Chem-E-Watt Corporation, Racine, Wis.
Filed Apr. 12, 1974, Ser. No. 460,492
Int. Cl.[2] F24J *1/04, 3/04*
U.S. Cl. 126—263 **26 Claims**



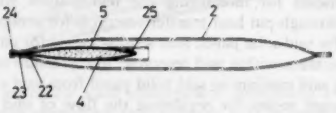
22. In a self contained heating device formed with an electrochemical heat cell using an anode member, a cathode member and shorting elements connected thereto, the improvement comprising a cathode member formed with an electrochemically active reducible material intermixed with a dry electrolyte material.

4,106,478

PACKAGED HEAT GENERATOR

Sunao Higashijima, No. 17-12, Daita 6-chome, Setagaya-ku, Tokyo, Japan

Filed Apr. 9, 1976, Ser. No. 675,569
Claims priority, application Japan, Jun. 9, 1975, 50-78482[U]; Oct. 14, 1975, 50-139783[U]; Oct. 14, 1975, 50-139784[U]; Oct. 14, 1975, 50-148764[U]; Mar. 19, 1976, 51-30641
Int. Cl.[2] F24J *1/00*
U.S. Cl. 126—263 15 Claims



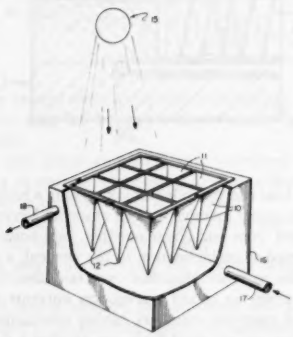
1. A packaged heat generator for warming objects, said heat generator comprising:
heat generating material;
first enclosing means of air-impermeable material surrounding said heat generating material for containing said heat generating material therein;
second enclosing means of air impermeable material surrounding said first enclosing means for containing said first enclosing means therein, said second enclosing means having air passage means therethrough for allowing air to enter into said second enclosing means;
oxidation promotion material within said second enclosing means and outside of said first enclosing means;
third enclosing means of air impermeable material surrounding said second enclosing means for removably containing said second enclosing means therein, said third enclosing means being openable and recloseable at one end.

4,106,479

SOLAR HEAT COLLECTOR

Ramona Rogers, 4708 Meadow La., Sioux City, Iowa 51104

Filed Aug. 6, 1976, Ser. No. 712,224
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—270 9 Claims



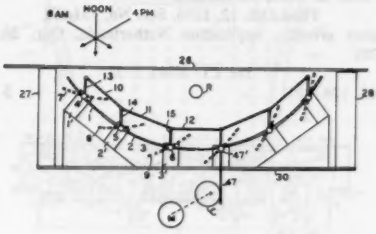
1. A solar energy collector comprising a plurality of solar radiation absorbing receivers, each of said receivers being in the shape of a hollow pyramid having an open base and extending to a point at the interior of the apex, means for joining said pyramids together at their bases, and means including the inner walls of the pyramids are operative to absorb solar radiation when said bases are oriented generally toward the sun, whereby the energy absorbed by the receivers is available for transfer to a working fluid.

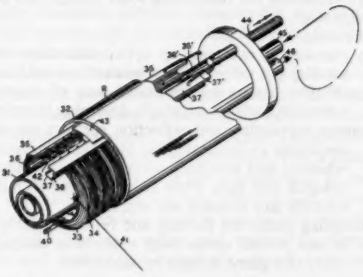
4,106,480

REFLECTIVE SOLAR HEAT COLLECTOR

Floyd A. Lyon, Brookville, and Henry Harrison, Locust Valley, both of N.Y., assignors to Halm Instrument Co., Inc., Glen Head, N.Y.

Continuation of Ser. No. 640,694, Dec. 15, 1975, abandoned.
This application Apr. 19, 1977, Ser. No. 788,983
Int. Cl.[2] F24T *3/02*
U.S. Cl. 126—270 5 Claims





1. A reflecting solar heat collector having a stationary receiver adapted to absorb sunlight, an array of parallel curved reflecting mirror strips under tension rotatably mounted having said receiver substantially at the focus of said mirrors, means for pivotally rotating said mirror strips substantially in unison about spaced-apart axes parallel to said receiver to track the sun's motion,
each of said mirror strips being a strip of flexible reflective film stretched between two end termination pivoting means, the said two end termination pivoting means being shaped to generate the curved cross-section contour of said reflecting mirror strip and adapted to rotate for tracking the sun about their common pivot axis which is parallel to the straight cylindrical shape of the mirror strip, said strip being detachably secured at each end to said end termination pivoting means.

4. A reflecting solar heat collector comprising a stationary cylindrical receiver surface adapted to absorb sunlight, an array of parallel curved reflecting mirror strips rotatably mounted having the said receiver surface substantially at the focus of said mirrors, means for pivotally rotating said mirror strips substantially in unison about spaced-apart axes parallel to said receiver surface to track the sun's motion and means for transferring heat from said cylindrical receiver surface for delivery to heat utilization apparatus, the mirrors being placed in a substantially parabolic arrangement with said receiver at its focus,
means for reducing the heat loss from said cylindrical surface,
said means for reducing heat loss including an evacuated transparent envelope surrounding said receiver surface in spaced apart substantially concentric relation,
said receiver surface being surrounded by a plurality of axially spaced-apart radiation-suppressing groved reflect-

ing discs of equal diameter concentric with said receiver surface, substantially parallel to rays of sunlight incident on said receiver surface, said discs adapted to reflect back substantially all the radiation from the said receiver surface which strikes their grooved reflecting surfaces.

4,106,481

APPARATUS FOR RECOVERING SOLAR ENERGY

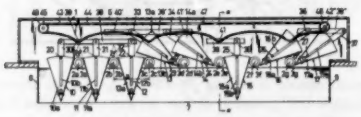
Josephus Petrus Maria van Kuijk, Chemin des Vignes 85, 1814 La Tour de Peilz, Switzerland

Filed Oct. 12, 1976, Ser. No. 731,671

Claims priority, application Netherlands, Oct. 20, 1975, 7512289

Int. Cl.² F24J *3/02*

U.S. Cl. 126—271 **5 Claims**



1. Apparatus for recovering solar energy, the combination comprising

a casing,

a plurality of warming-up cylindrical tubes extending in parallel and side-by-side relationship in said casing,

each tube having an associated pair of substantially flat reflection surfaces angularly diverging therefrom,

means supporting said reflection surfaces tangent to their associated cylindrical tubes and including pivotal means whereby said reflecting surfaces reflect incident sun rays towards said tube while being pivoted to maintain their bisector face towards the sun, and

coupling means for moving said reflecting surfaces relative to said pivotal means with a direction component transverse to a plane defined by said tubes.

4,106,482

AUTONOMIC SOLAR PANEL

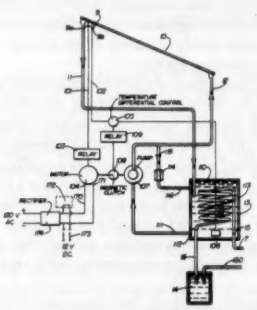
Fred L. Savage, #47 - 3987 Gordon Head Rd., Victoria, B.C., Canada (V8N 3X5), and Alfred D. Long, c/o 1100 Montreal Trust Bldg., 789 W. Pender St., Vancouver, B.C., Canada (V6C 2R8)

Filed Jul. 28, 1976, Ser. No. 709,386

Claims priority, application Canada, Apr. 27, 1976, 251184

Int. Cl.² F24J *3/02*

U.S. Cl. 126—271 **29 Claims**



1. An autonomic solar heat collecting system comprising: a solar collecting panel exposed to the sun's radiation, said solar collecting panel comprising a flat outer surface adapted to the direction of the sun's radiation, a flat or formed inner sheet closely spaced from the flat outer surface to provide a thin plate-like passageway between the inner sheet and the outer sheet, whereby heat transfer medium flowing therebetween is in the form of a thin fluid membrane, a hollow fluid-tight cavity provided by joining the inner and outer surfaces to one another and forming a bottom cavity and a top cavity, means for allowing entrance of a fluid into said bottom cavity, and gravity return means for the removal of said fluid from the said top cavity; heat transfer medium means for adsorbing the energy of the sun's radiation within said plate-like passageway of said panel; means for removing said medium from the panel, sensing means for monitoring the temperature within the panel; a through-put heat transfer reservoir for accepting said medium for said solar panel; heat sensing means for monitoring the temperature within said reservoir; low pressure means for returning said medium to said solid panel from said reservoir, low pressure means for regulating the flow of said medium from said reservoir to said solar panel comprising pump means operable under low wattage and low power and activated by a small predetermined temperature differential derived from said heat sensing means within said solar panel and said heat sensing means within said reservoir; and means for providing such low wattage, low power for the operation of said system.

4,106,483

SOLAR ENERGY COLLECTOR

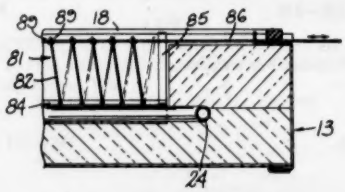
Everett M. Barber, Jr., Guilford, Conn., assignor to Sunworks, Inc., Guilford, Conn.

Continuation-in-part of Ser. No. 453,353, Mar. 21, 1974, Pat. No. 3,980,071. This application Aug. 30, 1976, Ser. No. 718,453

The portion of the term of this patent subsequent to Sep. 14, 1993, has been disclaimed.

Int. Cl.² F24J *3/02*

U.S. Cl. 126—271 **7 Claims**



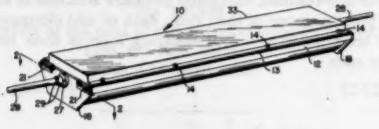
1. A solar heat energy collector comprising a housing having a transparent cover member and an absorber having an inside surface spaced from said cover member, said housing adpated to be supported at an inclination to the vertical, a plurality of thin, vane-like members disposed over said absorbing surface below said cover to retard convection currents within said housing, said vane-like members having substantially parallel facing surfaces spaced apart from one another a distance substantially greater than their thicknesses to permit solar energy to pass therebetween and to impinge upon said absorber surface substantially undeviated, and means for varying the angular disposition of said vanes with respect to said absorber surface to maximize the solar energy incident upon said absorber surface throughout a day, the edges of said vane-like members proximate said absorber surface being just above but not in contact therewith, said vane-like members extending across said housing in a horizontal direction.

4,106,484

ADJUSTABLE SOLAR CONCENTRATOR

Richard E. Dame, Silver Spring, Md., assignor to Mega Analytical Research Services, Inc., Silver Spring, Md.

Filed Mar. 31, 1977, Ser. No. 783,345
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—271 7 Claims



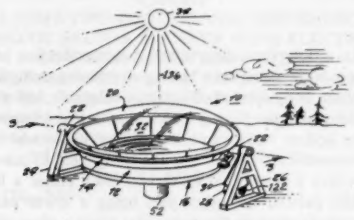
1. An adjustable solar concentrator comprising a receiver tube, means supporting said receiver tube including spaced walls, a reflector plate, support members connected to opposite edges of the reflector plate, trunnions projecting from the ends of said support members and rotatively mounted in said walls for supporting said members and the reflector plate between said walls, and means imparting moments to said support members for flexing the reflector plate to produce a geometrically correct cylindrical parabolic solar energy reflecting surface capable of producing a sharp solar image on said receiver tube.

4,106,485

SOLAR ENERGY REFLECTING SYSTEM

Joseph A. Polley, P.O. Box 361, Massapequa, N.Y. 11758

Filed Aug. 9, 1977, Ser. No. 823,131
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—271 10 Claims



1. A solar energy reflector system comprising:

a. a circular dish-like housing with outwardly flared peripheral walls;

b. upper and lower circular hoops supported within said housing in spaced relationship to each other, the upper hoop being largerthan the lower hoop;

c. means for mounting said hoops within said housing for movement relative to each other;

d. sensing means for detecting the position of the sun in the sky;

e. control means coupled to said upper and lower hoops responsive to said sensing means for displacing the hoops relative to each other;

f. a plurality of refelctor panels sequentially spaced around said peripheral wall; and

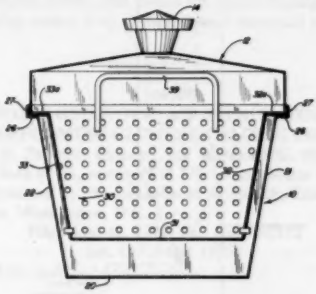
g. means for pivotally connecting said panels to said upper and lower hoops to lie in an outwardly flared direction, each of said panels pivoting with the displacement of said hoops, whereby the reflector configuration of the system is modified in accordance with the movement of the sun across the sky.

4,106,486

COOKING UTENSIL

B. Paul Lee, 15400 E. 14th Pl., Aurora, Colo. 80011

Filed Mar. 1, 1976, Ser. No. 662,509
Int. Cl.[2] A47J 27/04
U.S. Cl. 126—369 6 Claims



1. A cooking pan assembly comprising:

(a) an outer generally rectangular, open top pan having an outwardly extending shoulder peripherally around the edge of the opening and an upstanding flange on the outer edge of said shoulder;

(b) an inner, generally rectangular, open top pan having perforated sides, perforated ends and a unitary perforated bottom, wherein the sides are fixed to the bottom to form a fixed U-shaped channel, and the ends are pivotally hinged adjacent the bottom for movement from a closed position abutting the edges of the U-channel to an outwardly extending position for food removal, and an outwardly extending shoulder sized to seat on said shoulder on the outer pan and inside said upstanding flange, wherein said bottom is substantially spaced from said outer pan in its nesting position, and wherein said perforations in said inner pan are sufficiently large for free passage of liquids and steam and sufficiently small to support food in said inner pan;

(c) handle means fixed to and extending upwardly from each of said ends, whereby when the inner pan is lifted by said handle means, the ends tend to remain closed against the edges of the U-shaped channel because the ends are pivotally hinged to the U-shaped channel at locations adjacent the bottom; and

(d) cover means including sloped top portions from about the center to the sides thereof, said cover being sized and shaped to seat on said shoulder of the inner pan and in said upstanding flange, whereby said inner pan is completely enclosed and condensate from said cover flows into said outer pan.

4,106,487

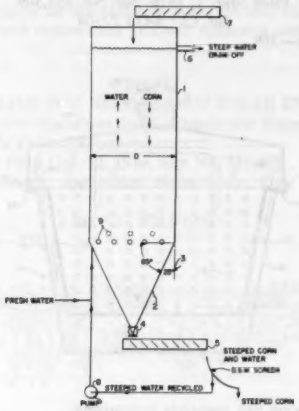
CONTINUOUS STEEPING OF CORN FOR WET PROCESSING TO STARCHES, SYRUPS AND FEEDS

James R. Randall, Decatur, Ill.; Arling K. Langhurst, Fairfax; Herman H. Schopmeyer, Cedar Rapids, both of Iowa, and Robert L. Seaton, Decatur, Ill., assignors to Archer Daniels Midland Company, Decatur, Ill.

Filed Jul. 20, 1977, Ser. No. 817,488
Int. Cl.[2] C13L 1/00
U.S. Cl. 127—23 5 Claims

5. An apparatus for steeping corn comprising a cylindrical tank having a cone bottom, the cone having an angle of 22°–28° from the vertical and a controllable outlet at the bottom of the cone and said tank having a plurality of inlets approximately at the junction of the cone with the straight sides of the tank, means for removing corn and water at the bottom of the cone

and means for passing said removed water into said inlets and means for removing water from near the top of said vertical



tank, the height of the cylindrical tank being about 1.5 to 2.5 times its diameter.

4,106,488

CANCER TREATMENT METHOD

Robert Thomas Gordon, 4936 W. Estes, Skokie, Ill. 60076

Continuation-in-part of Ser. No. 499,074, Aug. 20, 1974, abandoned. This application Jan. 22, 1976, Ser. No. 651,395

Int. Cl.[2] A61B *19/00;* **A61F** *7/00;* **A61K** *43/00*

U.S. Cl. 128—1 R **17 Claims**

1. The process for the treatment of cancer cells without substantially damaging living normal cells comprising:

providing one of a tumor specific material selected from an antibody and a radioisotope,

encapsulating said tumor specific material with material capable of being removed upon entering the cancer cell after a preselected time, to produce a total particle size of less than 1 micron,

intravenously injecting the encapsulated particles of tumor specific material,

removing said encapsulating material, and

releasing said tumor specific material within the cancer cells.

4,106,489

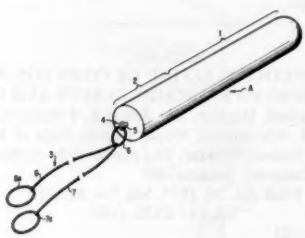
DEVICE TO STRENGTHEN MUSCLES

Kenneth W. Martin, 934 Fourth St. NE., Pulaski, Va. 24303

Filed Nov. 16, 1976, Ser. No. 742,093

Int. Cl.[2] A61B *19/00*

U.S. Cl. 128—1 R **4 Claims**



1. Means for strengthening muscles in a vaginal cavity comprising, in combination: a penile shaped element having a fore portion for insertion and against which said muscles are contracted as a radial force to grip said fore portion, and a base portion which remains outside said cavity; and elongated means attached to said base portion, at least a portion of said elongated means being resilient, said elongated means further having foot engaging elements on one end to tension said resilient portion to produce a controlled force of withdrawal of said fore portion, axial of said penile element, against the radial gripping force wherein said elongated means comprises a resilient member which is attached to said base portion, and a pair of non-resilient, elongated members attached to said resilient portion at one of their ends, each of said elongated members terminating in a foot engaging loop at their respevtice other ends.

4,106,490

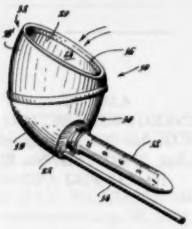
URINE COLLECTION AID

Raymond Spilman; Edward Emil Haase, Jr.; Kurt John Kruger; Donald Barry Budnick, and Vincent John Lasorso, Jr., all c/o Raymond Spilman Industrial Design 217 Bedford St., Stamford, Conn. 06901, assignors to Raymond Spilman; Edward Emil Haase, Jr.; Kurt John Kruger; Donald Barry Budnick; Vincent John Lasorso, Jr. and Louis H. Reens

Filed Sep. 27, 1976, Ser. No. 726,938

Int. Cl.[2] A61B *5/00*

U.S. Cl. 128—2 F **9 Claims**



1. An article for aiding in the direct collection of a urine sample in a specimen tube having an opening comprising

a hollow body formed of a pair of relatively movable parts, one upper part having a main opening at an upper end of the hollow body as determined by its normal operative orientation, said main opening being sized to conveniently receive a urine voiding stream from either a female or male person, the other part being a lower part which matingly engages the upper part along a plane of rotation to enable the upper part to be rotated from a male position to a female position to effectively reduce the vertical height of the collection aid when employed to receive a female voiding stream, said hollow body being formed with a wall which extends downwardly from the main opening to form a urine flow confining chamber with the mating engagement of said upper and lower parts, said hollow body being further sized sufficiently small for manual retention and manipulation in proximity to the exit point of the voiding stream from a person;

said wall further being provided at a bottom located lower segment of the lower part with specimen and excess outlets, said bottom located lower segment being selectively shaped to effectively guide the voiding stream to both of the outlets with normal operative orientation of the urine collection aid; and

said specimen and excess urine outlets being selectively spaced relative to each other to enable excess urine to be drained away while a specimen sample of urine is passed through the specimen outlet for sample collection in a specimen tube having its opening in communication with the specimen outlet.

4,106,491
DEVICE FOR PROLONGED INTRAVASCULAR INFUSION

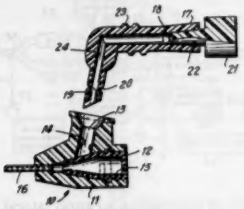
Luis A. Guerra, Apt. 3A, 239 Central Park West, New York, N.Y. 10024

Continuation-in-part of Ser. No. 598,902, Jul. 24, 1975, Pat. No. 3,996,923, and a continuation-in-part of Ser. No. 344,387, Mar. 23, 1973, Pat. No. 3,906,930. This application Dec. 13, 1976, Ser. No. 749,948

The portion of the term of this patent subsequent to Dec. 14, 1993, has been disclaimed.

Int. Cl.[2] A61B *5/00*

U.S. Cl. 128—2 F **12 Claims**



1. An improvement in a device for introducing fluids into a blood vessel over extended periods of time, comprising a support portion removably and sealingly connectable with a source of intravenous fluid, of medication in solution or of alimentation in solution, said support portion comprising a body having a passage therethrough and an aperture connecting with said passage and forming a junction therewith, valve means at the proximal end of said passage and normally closing said aperture at said junction, and a cannula, the proximal end of said cannula being tightly sealed in the distal end of said passage, said valve means being operable by exertion of mechanical force through said aperture.

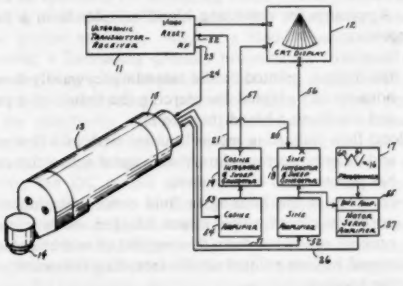
4,106,492
REAL TIME TWO-DIMENSIONAL MECHANICAL ULTRASONIC SECTOR SCANNER WITH ELECTRONIC CONTROL OF SECTOR WIDTH

William H. Schuette, McLean, Va., and George F. Norris, Kensington, Md., assignors to The United States of America as represented by the Secretary of the Department of Health, Education and Welfare, Washington, D.C.

Filed Jan. 12, 1977, Ser. No. 758,851

Int. Cl.[2] A61B *5/00*

U.S. Cl. 128—2 V **10 Claims**



1. A real time ultrasonic scanning apparatus for medical examination of the body, the apparatus comprising hand-held housing means provided with a pivoted transducer and a reversible servo motor drivingly connected to said transducer, means for generating a positional electrical signal function varying in accordance with the angular position of said transducer over a scanning range of oscillation, programming means for generating periodic substantially triangular control wave signals including linear forward and reverse sections, position feedback control means for energizing said servo motor in accordance with the difference between the values of the position signal function and the triangular signals over the scanning range of oscillation of said transducer, pulse scan display means, means operatively connecting said transducer to said display means, and means for synchronizing said pulse scan display means with said positional electrical signal function.

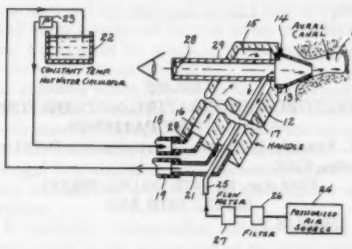
4,106,493
BIPHASIC OTOSCOPIC AIR STIMULATOR FOR PERFORMING CLINICAL CALORIC TESTS

Leonard R. Proctor, Chicago, and Raymond G. Byrnes, Oak Lawn, both of Ill., assignors to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Filed Jan. 13, 1977, Ser. No. 759,172

Int. Cl.[2] A61B *19/00*

U.S. Cl. 128—2 R **10 Claims**



1. An apparatus for stimulating an aural canal of a patient comprising an insulating handle member, means to view the aural canal of an ear comprising a viewing tube having a forward discharge end and a rear end and mounted on said handle member and having frusto-conical nozzle means at its forward end adapted to be inserted in a patient's ear to continuously pass alternately heated and cooled gas to the aural canal and then out of the aural canal, a source of pressurized gas, conduit means connecting said source to said viewing tube and passing through said insulating handle, and means for precisely controlling the temperature of gas entering the aural canal comprising heat exchanger means surrounding at least a portion of said conduit means, the location of said heat exchanger means relative to said nozzle means being such that the temperature of said gas entering the aural canal is precisely controlled.

4,106,494
HEART DEFIBRILLATING AND MONITORING SYSTEM

Robert A. McEachern, Wellesley, Mass., assignor to American Optical Corporation, Southbridge, Mass.

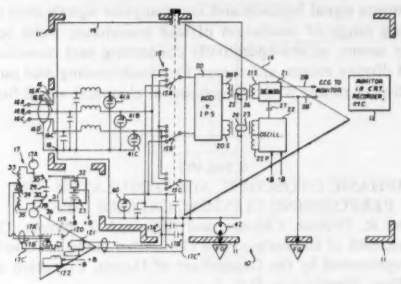
Filed Aug. 29, 1977, Ser. No. 828,395

Int. Cl.[2] A61B *5/04*

U.S. Cl. 128—2.06 B **7 Claims**

1. In a heart defibrillating and monitoring system having a source of high-voltage defibrillating signals and signal monitoring means for monitoring signals indicating heart activity, a first electrode system for selectively applying defibrillating signals to a patient and for selectively applying monitoring signals to the means for monitoring signals, and a second electrode system for selectively applying monitoring signals to the means for monitoring signals, said means for monitoring signals include a first isolation amplifier, switch means for selectively applying monitoring signals to said first isolation amplifier alternatively from said first electrode system or from said second electrode system, the improvement comprising a sec-

ond isolation amplifier coupled intermediate said first electrode system and said switch means, whereby to prevent current



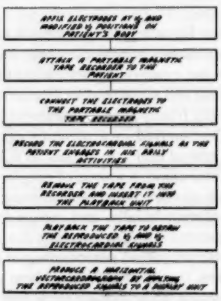
leakage between said first electrode system and said second electrode system during application of a defibrillating signal.

4,106,495

VECTORCARDIOGRAPHIC METHOD FOR AMBULATORY PATIENTS

Harold L. Kennedy, Baltimore, Md., assignor to Del Mar Avionics, Irvine, Calif.

Filed Apr. 11, 1977, Ser. No. 786,252
Int. Cl.[2] A61B 5/04
U.S. Cl. 128—2.06 V **7 Claims**


AFFIX ELECTRODES AT ½ AND MODIFIED ½ POSITIONS ON PATIENT'S BODY
ATTACH A PORTABLE MAGNETIC TAPE RECORDER TO THE PATIENT
CONNECT THE ELECTRODES TO THE PORTABLE MAGNETIC TAPE RECORDER
RECORD THE ELECTROCARDIAL SIGNALS AS THE PATIENT ENGAGES IN HIS DAILY ACTIVITIES
REMOVE THE TAPE FROM THE RECORDER AND INSERT IT INTO THE PLAYBACK UNIT
PLAY BACK THE TAPE TO REPRODUCE THE REPRODUCED ½ AND ½ ELECTROCARDIAL SIGNALS
PRODUCE A HORIZONTAL VECTORCARDIOGRAM BY APPLYING THE REPRODUCED SIGNALS TO A DISPLAY UNIT

1. A method of obtaining a horizontal vectorcardiogram from an ambulatory patient, comprising the steps of:

(a) affixing electrodes at predetermined positions on the patient's body to pick up electrocardiac signals of the ambulatory patient;

(b) attaching a portable magnetic tape recorder to the patient;

(c) connecting the electrodes to the portable magnetic tape recorder;

(d) recording on separate tracks in a magnetic recording tape inserted in the portable magnetic tape recorder the electrocardiac signals picked up by the electrodes as the patient engages in his daily activities;

(e) removing the magnetic recording tape from the portable magnetic tape recorder and inserting it into a playback apparatus;

(f) playing back the magnetic recording tape to produce two simultaneous reproduced electrocardiac electrical signals;

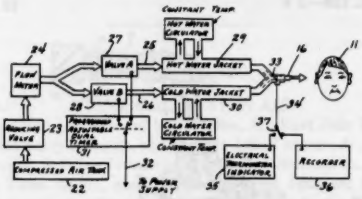
(g) producing a horizontal vectorcardiogram by applying the two simultaneous reproduced electrocardiac electrical signals to orthogonal inputs of a display unit.

4,106,496

METHOD AND APPARATUS FOR AIR CALORIC TESTING FOR THE EVALUATION OR AURAL VESTIBULAR DISORDERS

Leonard R. Proctor, Baltimore, Md.; Rollin C. Dix, Chicago, Ill., and Werner A. Metz, Atlanta, Ga., assignors to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Filed Dec. 23, 1976, Ser. No. 753,945
Int. Cl.[2] A61B 19/00, 10/00
U.S. Cl. 128—2 R **12 Claims**



1. A method of stimulating an aural lateral canal passage for evaluating vestibular responsiveness comprising the steps of irrigating the canal with air heated to a precise and controlled temperature above the body temperature for a brief period of time sufficient to develop a predetermined temperature difference across the canal passage, then promptly removing said heated air at the end of said brief period and irrigating the canal for a brief period unequal to the first brief period with relatively cold air precisely controlled at a temperature below body temperature, to first reduce said temperature difference to zero and then produce a second temperature difference across the canal passage, and then again irrigating the canal with said precisely heated hot air for a brief but different period of time than said initial period of time, to first reduce said second temperature difference to zero and then produce a third temperature difference across the canal passage.

4,106,497

MULTIPLE SAMPLE NEEDLE ASSEMBLY WITH INDICATOR MEANS

Edward P. Percarpio, North Haledon, N.J., assignor to Becton, Dickinson and Company, East Rutherford, N.J.

Filed Feb. 4, 1977, Ser. No. 765,868
Int. Cl.[2] A61M 5/00
U.S. Cl. 128—2 F **15 Claims**

1. Apparatus for collecting blood samples from a patient comprising:

a housing;

a first hollow, pointed needle extending forwardly from the housing and adapted for piercing the tissues of a patient and conducting blood therefrom;

blood flow indicating means coupled with said first needle and adapted to provide a visual signal when the sample has penetrated a blood vessel;

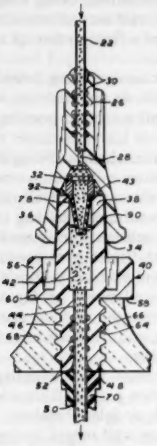
a chamber in the housing in fluid communication with a normally closed valve means adapted when closed to prevent any blood from flowing out of said chamber;

a second hollow pointed needle extending rearwardly from the housing;

said valve means adapted to be activated and shifted from the normally closed position to an open position to permit flow of blood from the patient to a blood sample container;

said blood flow indicating means including control means to provide for a limited amount of blood to be directed to a predetermined location for indication purposes and to isolate the limited amount of blood and to prevent leakage

beyond the desired location including means facilitating the prevention of collection of the limited amount of



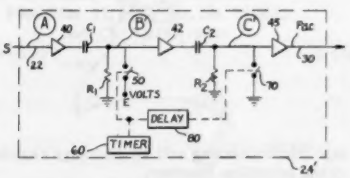
blood with the blood sample accumulated in the container.

4,106,498

INITIALIZATION CIRCUIT

Jerry D. Haney, Sunnyvale, Calif., assignor to American Optical Corporation, Southbridge, Mass.

Filed Dec. 27, 1976, Ser. No. 754,486
Int. Cl.[2] A61B *5/02*
U.S. Cl. 128—2.05 A **9 Claims**



1. In an apparatus for measuring blood pressure of a patient, including means for applying a selectively changeable pressure to the patient externally adjacent a blood vessel, means for measuring a fluctuating quantity proportional to a sum, said sum comprising a time-dependent fluctuating component representative of the pulsatile pressure within the blood vessel, plus the selectively changeable pressure applied externally adjacent the blood vessel, filter means having an AC time constant for separating said fluctuating component from said quantity, the DC output level of said filter means being a predeterminable value at steady-state following a start-up interval, and an analytical means responsive to said fluctuating component from said filter means for providing an indication of the patient's blood pressure, the improvement comprising:

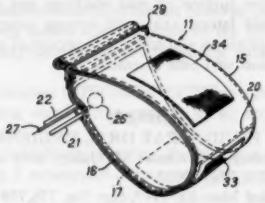
Means for initializing said filter means during start-up of said apparatus, said initializing means comprising means for temporarily applying a predetermined potential to said filter means during at least the latter portion of a start-up interval and for removing said potential substantially at the end of said start-up interval, said predetermined potential corresponding substantially with said predeterminable steady-state DC output from said filter means.

4,106,499

SPHYGMOMANOMETER CUFF

Kazuo Ueda, Tokyo, Japan, assignor to Ueda Works Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 630,466, Nov. 10, 1975, abandoned. This application Apr. 1, 1977, Ser. No. 783,524
Int. Cl.[2] A61B *5/02*
U.S. Cl. 128—2.05 C **6 Claims**



1. A sphygmomanometer cuff comprising:

(i) an elongated flexible strap of a length sufficient to wrap by at least one and half turns about a limb of a patient, said strap being constituted by two layers of material which, over a portion of the length of the strap are spaced apart to define an internal pocket,

(ii) an inflatable pouch disposed in said pocket and having a first connector tube for connecting to a source of fluid under superatmospheric pressure and a second connector tube for connecting to a sphygmomanometer,

(iii) a rigid loop-shaped member secured at a first end of the strap and defining with the strap an elongated transverse opening,

(iv) a resiliently compressible rod-like member secured transversely at the second end of the strap, said rod-like member being adapted for forcing, with resilient deformation, through the opening defined by the loop-shaped member, said rod-like member in its unstressed condition being too thick to pass back through said opening,

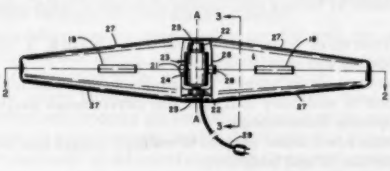
(v) a first and second cooperable fastening members, said first fastening member being secured externally on a face of said strap adjacent to said first end thereof, said second fastening member being secured externally on said face of said strap adjacent to said second end thereof, the distance between the first and second fastening members, longitudinally of the strap, and the dimensions of the first and second fastening members longitudinally of the strap, being selected such that with the strap tightened about a patient's limb, the portion of the strap terminating at its second end may be doubled over externally to superimpose the second fastening member on the first fastening member.

4,106,500

MASSAGING APPARATUS

Samuel C. Burchart, 822 W. 46th St., Richmond, Va. 23225

Filed Apr. 14, 1977, Ser. No. 787,689
Int. Cl.[2] A61H *1/00*
U.S. Cl. 128—36 **6 Claims**



1. An apparatus for use in combination with an orbital vibrator comprising a base assembly comprised of an elongated flat rigid platform symmetrically shaped with respect to its longi-

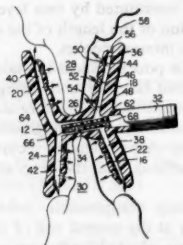
tudinal and lateral axes and tapering from a wide region at said lateral axis to a narrow region at each longitudinal extremity, and resilient cushioning material of uniform thickness evenly disposed on the upper and lower surfaces of said platform, a pair of holding members anchored in said platform and extending above said cushioning material above the upper surface of said platform and equidistantly spaced from said lateral axis, and harness means located above said cushioning material above the upper surface of said platform and substantially centered on said lateral axis, said harness means being anchored in said platform and adapted to secure an orbital vibrator tightly against said base assembly.

4,106,501

SWEEPING FLUID SPRAY ORAL HYGIENE DEVICE

Amber Lola Ozbey, and Ahmet M. Ozbey, both of 8221 Clay Dr., Oxon Hill, Md. 20022

Filed Mar. 11, 1977, Ser. No. 776,759
Int. Cl.[2] A61C *15/00*
U.S. Cl. 128—62 A **16 Claims**



1. A fluid jet spray oral hygiene device for cleaning the teeth and gums comprising a mouthpiece having at least one channel to receive the teeth of a user, said channel being defined by a front wall, a rear wall spaced from said front wall and web means extending between said front and rear walls at one end thereof, conduit means for supplying fluid to said mouthpiece, fluid jet forming means provided in said front and rear walls for directing a plurality of fluid jets into said channel against the teeth of a user, and fluid conducting means formed in said mouthpiece for connecting said fluid jet forming means to said conduit means, said web means operating in response to the application and release of pressure when a user chews upon the web means to move the free ends of said front and rear walls toward and away from the teeth to cause said fluid jets to sweep up and down the surface of the teeth of a user.

4,106,502

RESUSCITATOR

Porter C. Wilson, Tucson, Ariz., assignor to Margaret M. Laurence, Arlington, Va.

Filed Nov. 18, 1976, Ser. No. 742,884
Int. Cl.[2] A61M *16/00*
U.S. Cl. 128—145.8 **23 Claims**

1. A mouth to mouth resuscitator for rendering artificial respiration by forcing tidal breaths of air into a victim comprising:

a resuscitator body unit having a top portion, a bottom portion and exterior side wall means;

top cover means adapted to sealingly engage said top portion of said body unit, said top cover means having an opening therethrough;

bottom cover means adapted to sealingly engage said bottom portion of said body unit;

said body unit further having first and second interior wall means, said interior wall means together with said top cover means, said bottom cover means and said exterior wall means defining within said body unit a fresh air inlet chamber, an air exchange chamber, and a victim inhalation chamber;

said fresh air inlet chamber being defined by said first interior wall means, said second interior wall means, said top cover means and a first portion of said exterior side wall means;

said air exchange chamber being defined by said first interior wall means, said second interior wall means, said top cover means and a second portion of said exterior side wall means;

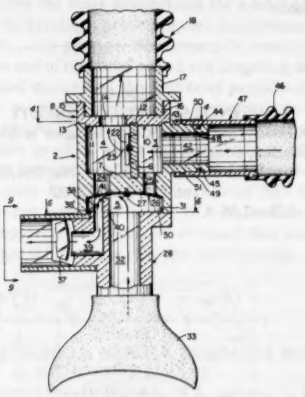
said victim inhalation chamber being defined by said second interior wall means, said bottom cover means and a third portion of said exterior side wall means;

said exterior side wall means having an air inlet means connected thereto, said air inlet means having an inlet port therethrough, said inlet port opening into said fresh air inlet chamber and externally of said body unit;

said first interior wall means having an operator inhalation passage therethrough, said operator inhalation passage interconnecting said fresh air inlet chamber and said air exchange chamber;

first flap valve means for preventing flow through said operator inhalation passage from said air exchange chamber to said fresh air inlet chamber;

said second interior wall means having an operator exhalation passage therethrough, said operator exhalation passage interconnecting said air exchange chamber and said victim inhalation chamber;



second flap valve means for preventing flow through said operator exhalation passage from said victim inhalation chamber to said air exchange chamber, said operator exhalation passage being opened by the exhalation of the operator;

air exchange hose means having a first end thereof attached to said top cover means, said air exchange hose means communicating with said air exchange chamber through said opening in said top cover means, the free end of said hose means having a mouthpiece into which the operator breathes;

face mask means attached to said bottom cover means;

said bottom cover means having an exterior wall means and an interior wall means, said interior wall means and a first portion of said exterior wall means defining a connecting passage which interconnects said victim inhalation chamber and said face mask means;

said interior wall means and a second portion of said exterior wall means of said bottom cover means defining an exhalation passage, said exhalation passage terminating at one end thereof at an exhalation port formed through said exterior wall means and at the other end thereof at an exhalation intake port disposed adjacent to said operator exhalation passage such that when said second flap valve

means is opened by the exhalation of the operator said second flap valve means closes said exhalation intake port, said exhalation port opening externally of said body unit and being in fluid communication with said victim inhalation chamber except when said exhalation intake port is closed by said second flap valve means;

a by-pass passage interconnecting said fresh air inlet chamber and said victim inhalation chamber; and third valve means permitting flow through said by-pass chamber from said fresh air inlet chamber to said victim inhalation chamber upon inhalation of the victim at any desired time;

whereby inhalation of the operator on said mouthpiece causes said first flap valve to open thus allowing fresh air to be drawn into said body unit through said inlet port, said air passing through said fresh air inlet chamber, said operator inhalation passage, said air exchange chamber and then through said air exchange hose means;

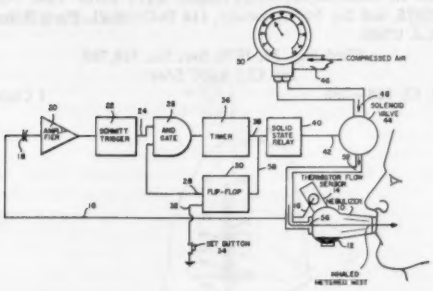
whereby exhalation of the operator causes said first flap valve means to close so as to close said operator inhalation passage and further causes said second flap valve means to open so as to open said operator exhalation passage and so as to close said exhalation intake port, thereby allowing air to pass from said air exchange hose means and into said face mask means through said air exchange chamber, said operator exhalation passage, said victim inhalation chamber and said connecting passage; and

whereby exhalation of the victim causes said second flap valve means to close said operator exhalation passage and to open said exhalation intake port, thereby allowing the victim's exhalation to pass out of said body unit through said connecting passage, said victim inhalation chamber, said exhalation intake port, said exhalation passage and said exhalation port.

4,106,503
METERING SYSTEM FOR STIMULATING BRONCHIAL SPASM

Richard R. Rosenthal, 4301 Ann Fitz Hugh Dr., Annandale, Va., and Joseph French, Joppa, Md., assignors to Richard R. Rosenthal, Annandale, Va.

Filed Mar. 11, 1977, Ser. No. 776,662
Int. Cl.[2] A61M *16/00*
U.S. Cl. 128—194 **2 Claims**



1. A system for metering an aerosol provocative substance for patient inhalation comprising:

nebulizing means for normally containing the provocative substance in a liquid medium, the nebulizing means having an inlet and an outlet, the outlet delivering nebulized provocative substance to a patient;

means mounted to the nebulizing means for detecting the initiation of inhalation by the patient and generating a detection signal in response thereto;

timing means having its input connected in circuit with the detecting means and responsive thereto for generating a timing signal of preselected duration;

a source of compressed gas;

valving means responsive to said timing signal and driven open during the timing signal and connected between the gas source and said inlet of the nebulizer for nebulizing a metered dose of the nebulized provocative substance, depending upon the timing signal duration;

means connected in circuit between the detecting means and the timing means for triggering the timing means;

gating means connected in circuit between the output of the triggering means and the input of the timing means for permitting the passage of a triggering signal to the timing means;

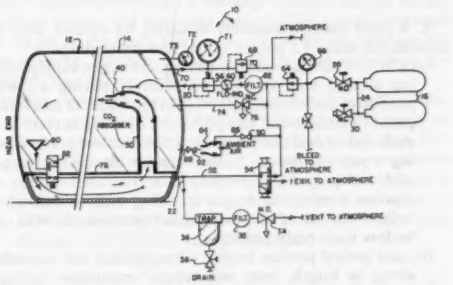
means responsive to the end of the timing signal for blocking the gating means from passage of an erroneous trigger signal; and

means for selectively resetting the blocking means thereby enabling a subsequent passage of a triggering signal.

4,106,504
PORTABLE RECOMPRESSION CHAMBER WITH AIR SCRUBBER

Floyd L. York, Honolulu, Hi., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 6, 1976, Ser. No. 747,833
Int. Cl.[2] B63C *11/32*
U.S. Cl. 128—204 **12 Claims**



1. An air supply system for a recompression chamber comprising:

a chamber;

inlet and outlet conduits sealably extending through the chamber so that each conduit has an interior and an exterior portion with respect to the chamber;

the exterior portion of the inlet conduit being adapted for connection to a pressurized air source and the outlet conduit serving as a vent of chamber air;

fluid amplifier means located within the chamber for sucking in and discharging a secondary fluid flow upon receiving a primary fluid flow;

the interior portion of the inlet conduit being connected to the fluid amplifier means for supplying air from the pressurized air source as said primary fluid flow so that chamber air is sucked in and is discharged as the secondary fluid flow through the fluid amplifier means;

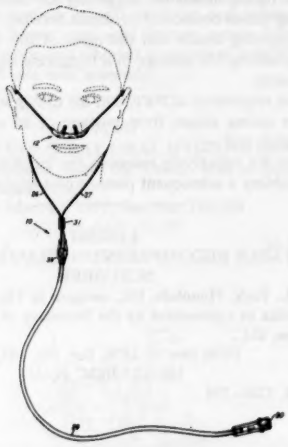
a secondary conduit connected in parallel with the outlet conduit and having an end located outside the chamber for connection to the pressurized air source;

valve means interconnected in the secondary conduit for selectively opening the secondary conduit to the pressurized air source so as to enable the chamber to be quickly compressed, or selectively opening the secondary conduit to space outside the chamber so as to exhaust the chamber, or selectively closing off the secondary conduit to both the pressurized air source and the space outside the chamber.

4,106,505
NASAL CANNULA ASSEMBLY

Peter W. Salter, and William W. Cook, both of Arvin, Calif., assignors to Salter Labs., Inc., Arvin, Calif.

Filed Jan. 17, 1977, Ser. No. 760,239
Int. Cl.[2] A61M *16/00*
U.S. Cl. 128—206 8 Claims



1. A nasal cannula assembly designed for contact with the nasalabidial area of a patient's nose and comprising:

(a) a hollow tubular member having an oxygen supply opening at each end, said tubular member having a central portion of sufficient length to span the width of an average patient's nostrils and end portions extending acutely from each end of said central portion, said central portion having a pair of spaced, hollow tubular extensions integral with and projecting normally therefrom said tubular extensions terminating in gas directing orifices and which hollow portion of said extensions communicate with said hollow main body portion,

(b) said central portion having a longitudinal axis extending along its length, each said tubular extensions having a longitudinal axis, said longitudinal axis of said central portion and said longitudinal axis of said extensions lying in a first plane each said end portions of said tubular member having a longitudinal axis lying in a second plane, said longitudinal axis of said central portion also lying in a third plane perpendicular to said first plane, each said end portion longitudinal axis lying in said second plane and projecting from said first and third planes at an acute angle greater than zero, said orifices of said tubular extensions angled acutely from said first plane toward said second plane.

4,106,506
CATHETER

Wilbur R. Koehn, deceased, late of Sands Point, N.Y.; by Elizabeth M. Koehn, executrix, and by Theodore Ellenoff, executor, both of 2 Henhawk La., Huntington, N.Y. 11743

Division of Ser. No. 420,881, Dec. 3, 1973, Pat. No. 3,943,225, which is a continuation of Ser. No. 148,103, May 28, 1971, abandoned. This application Jan. 26, 1976, Ser. No. 652,614
Int. Cl.[2] A61M *5/00, 25/00*
U.S. Cl. 128—214.4 13 Claims

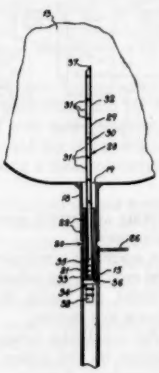
1. In a surgical apparatus for delivering fluids to or withdrawing fluids from a human body, including a flexible catheter, which surrounds the shank and at least one part of the handle of a penetrating element, said catheter having a free end positioned adjacent the pointed end of the penetrating element and a fitting at its opposite end, said penetrating element and catheter being cooperable to cause the catheter to follow said pointed end through the skin to locate the free end of the catheter at a predetermined position in the body, the free end of the catheter and the pointed end of the penetrating element being relatively displacable to permit the penetrating element to be withdrawn through the aatheter tube, wherein the improvement comprises said fitting having a funnel-shaped neck; said opposite end of said catheter forming an overlying layer

on said neck; a funnel-shaped relatively-rigid ring surroundly embedded in and substantially overlying the outer surface of said layer without any compressive force-fit thereon; said neck, said layer formed at said opposite end of said catheter, and said ring, all being bonded together in a substantially non-stressed relationship and being substantially concentric with respect to one another; and said layer being fixed to said neck and said ring.

4,106,507
BLOCKAGE PREVENTION DEVICE FOR BODY FLUID COLLECTION SYSTEMS

Janet R. Kellermeyer, 525 Prospect Ave., River Vale, N.J. 07675, and Jay M. Alexander, 114 DeGroff Pl., Park Ridge, N.J. 07656

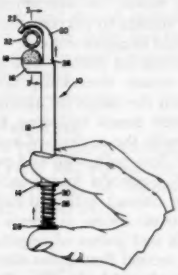
Filed Aug. 30, 1976, Ser. No. 718,780
Int. Cl.[2] A61F *5/44*
U.S. Cl. 128—295 1 Claim



1. In a body fluid collection system, the combination comprising

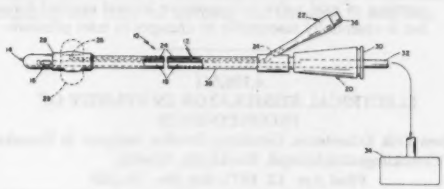
a flexible collection bag having
a bag inlet adjacent one end thereof adapted to be coupled to the stoma of a patient to receive body fluids therefrom,
a neck portion at the other end thereof, and
a bag outlet in said neck portion for draining fluids from the bag, said bag outlet comprising a hollow cylindrical adapter;
a connection tube having said adapter inserted into one end thereof, the other end of said tube being adapted to be coupled to a body fluid storage receptacle; and
an elongated blockage prevention member comprising
a length of cylindrical tubing removably disposed in the interior of said bag having one end thereof extending through said bag outlet to the exterior of said bag and the other end thereof extending through said neck portion of the bag to that portion of the interior of the bag outside of the neck portion, said cylindrical tubing having walls defining a passageway extending through said tubing along the length thereof and a plurality of apertures extending through said walls at spaced points along the length of the tubing to connect said passageway to the exterior of said tubing, and
a hollow cylindrical fitting having one end thereof inserted in said one end of said cylindrical tubing and the other end thereof having a collar formed thereon, said collar having a cross-sectional area greater than the cross-sectional area of said bag outlet, so that said collar abuts the bag outlet exteriorly of the bag to limit insertional movement of said member into the bag, said collar having a diameter substantially the same as the diameter of said adapter, so that said collar is held in place against the adapter by said connection tube to prevent withdrawal of said member from said bag,
whereby body fluids collecting in said bag because of a blockage in the neck portion thereof are drained through said apertures and said passageway of the blockage prevention member to said bag outlet.

4,106,508
CLAMP DEVICE
Richard Barnard Berlin, 309 Engle St., Englewood, N.J. 07631
Filed Aug. 31, 1976, Ser. No. 719,283
Int. Cl.[2] A61B *17/12*
U.S. Cl. 128—346 **7 Claims**



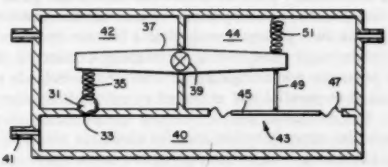
1. A clamp device adapted for occluding flexible tubular conduits comprising (1) a hook-shaped first jaw member with a concave inner surface, which jaw member is attached to an extended shaft, said first jaw member together with said shaft forming the shape of a J; (2) a second jaw member with a resiliently deformable convex inner surface, which jaw member is attached to an extended shaft, wherein said extended shafts are coextensively and slidably connected for moving and guiding said jaw members to maintain the concave and convex inner surfaces of said jaw members in an oppositely disposed and longitudinally engageable contacting relationship; and (3) biasing means for urging said jaw members into concave and convex inner surface contacting and conforming proximity.

4,106,509
CATHETERS
Daniel M. McWhorter, Arlington Heights, Ill., assignor to The Kendall Company, Boston, Mass.
Filed Aug. 5, 1976, Ser. No. 711,774
Int. Cl.[2] A61M *25/00*
U.S. Cl. 128—349 B **8 Claims**



1. In a drainage system including a hollow catheter comprising a tubular shaft having proximal and distal ends, an inflatable sleeve surrounding the shaft adjacent the distal end thereof and upon inflation retaining the catheter in position by formation of an enlarged balloon surrounding the shaft, a first opening adjacent the distal end of the shaft through which body fluids may pass into a drainage channel defined by the drainage system and extending from the first opening through the length of the shaft, and a second opening spaced from the first opening through which the fluids may pass from the channel, that improvement comprising:
tubing connected to the proximal end of said catheter, defining a portion of said drainage channel, and having an outlet communicating with a receptacle; at least a longitudinally-extending circular in transverse cross-section portion of said tubing being of a porous material which is pervious to air but impervious to body fluids and which is not-wettable by body fluids, whereby air may pass through said material to said channel.

4,106,510
SERVO VALVE
Salomon Hakim, and Carlos A. Hakim, both of Bogota, Colombia, assignors to Hakim Company Limited, Saint Vincent, Saint Vincent
Filed Nov. 26, 1976, Ser. No. 745,072
Int. Cl.[2] A61M *27/00*
U.S. Cl. 128—350 V **9 Claims**



1. A servo valve comprising:
a valve element;
a valve seat against which said valve element operates to control flow through the valve, the inlet pressure tending to open the valve;
first spring means for biasing said valve element in a manner tending to close the valve;
a diaphragm one side of which is exposed to the inlet pressure;
second spring means biasing said diaphragm against the inlet

pressure thereby defining the compliance of the diaphragm to changes in inlet pressure;

said diaphragm, said valve element and said seat being mechanically coupled in such a manner that the bias exerted by said first spring means is responsive to displacement of said diaphragm in such a manner that the force exerted by said first spring means on said valve element is increased in the same proportion as any increase in the inlet pressure so that the valve remains closed in the absence of any unbalancing additional force; and

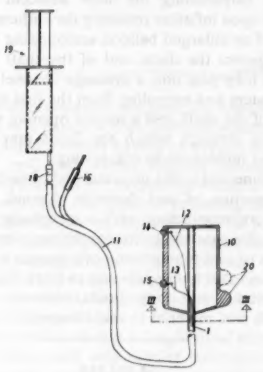
means for applying to said valve element an additional, control force for controlling its opening whereby the opening of said valve is responsive to said control force but is essentially insensitive to changes in inlet pressure.

4,106,511

ELECTRICAL STIMULATOR IN REMEDY OF INCONTINENCE

Bjorn Erik Erlandsson, Goteborg, Sweden, assignor to Svenska Utvecklingsaktiebolaget, Stockholm, Sweden

Filed Apr. 12, 1977, Ser. No. 786,855
Claims priority, application Sweden, Apr. 21, 1976, 7604553
Int. Cl.² A61N 1/04
U.S. Cl. 128—407 **17 Claims**



1. An electical stimulator comprising an obturator intended to be worn within the vagina or anus, said obturator being provided with electrodes energized by a pulse generator and thereby controlling the urethral-, the bladder and/or the rectal function, and said obturator being made of a flexible material, which is expandable and thus provides a safe fixation of the obturator within the body, wherein the obturator is provided with a substantially plane or somewhat curved end gable at its inner end as seen from its position of use, the electrodes being arranged in two groups arranged at a certain distance from each other, each group being electrically connected to the pulse generator and comprising a number of electrode plates connected in parallel and arranged in substantially the same plane, the electrode plates of both grops being directed towards the same direction and the electrode plates of each group extending over only a part of the circumference of the obturator for achieving a directional stimulating effect.

4,106,512

TRANSVENOUSLY IMPLANTABLE LEAD

Hans Jurgen Bisping, Aachen, Fed. Rep. of Germany, assignor to Medtronic, Inc., Minneapolis, Minn.

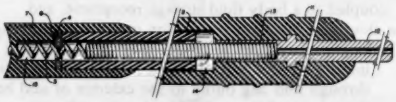
Filed Dec. 16, 1976, Ser. No. 751,226
Int. Cl.² A61N 1/04
U.S. Cl. 128—418 **21 Claims**

1. A body-implantable lead of materials substantially inert to body fluids and tissue comprising:

a length of electrical conductor having proximal and distal ends;

an electrode connected to the distal end of said conductor, said electrode having tissue engaging means for securely engaging said electrode in contact with body tissue;

sheath means having proximal and distal ends for loosely receiving and insulating said conductor from body tissue, said conductor being adapted to be axially advanced from its proximal end in and relative to said sheath means; and



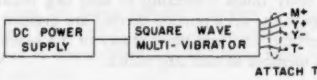
electrode head means attached to the distal end of said sheath means for receiving and isolating said electrode from body fluids and tissue, said electrode head means further comprising means for loosely engaging at least a portion of said electrode and for allowing the axial advancement of said electrode a predetermined distance from said sheath means upon advancement of said conductor in and relative to said sheath means.

4,106,513

DEVICE AND METHOD FOR THREE POINT ELECTRO THERAPY

J. C. Tzeng, 2801 S. King Dr., Apt. 1007, Chicago, Ill. 60616

Filed Feb. 17, 1976, Ser. No. 658,849
Int. Cl.² A61N 1/32
U.S. Cl. 128—420 R **4 Claims**



1. An apparatus for providing electric current at a low voltage to a body for healing purposes, the improvement comprising:

a power supply of positive and negative direct current voltage;

means for converting said voltage into pulsating form and including means for alternating pulses of positive and negative voltage to prevent simultaneous supply of both positive and negative voltage;

electrode means for contact with said body; and,

conductor means electrically connecting said electrode means with the means for alternating pulses;

said electrode means including first electrode means for contact with the surface of said body to create a first electrical flow path with said pulses of positive voltage, and, said electrode means including second electrode means for contact with said body in proximity with the first electrode means to create a second electrical flow path with said pulses of negative voltage whereby said first and second flow paths allow for electric current to pass through said body in an alternating, pulsating rate.

4,106,514

ARTICLE OF WEARING APPAREL PROVIDING AN UNDERGARMENT

Leonard Cecil Lowth, London, England, assignor to Scholl Inc., Chicago, Ill.

Filed Jan. 10, 1977, Ser. No. 757,940
Int. Cl.² A41B 9/04
U.S. Cl. 128—519 **16 Claims**

1. An article of wearing apparel providing an undergarment which will in and of itself provide for support in the abdomi-

nal, thigh, groin and leg areas of the wearer's body, comprising:

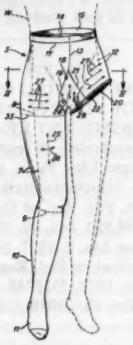
a leg portion shaped to cover at least the upper part of one of a wearer's legs from the knee up and attached at its upper end to a first upper thigh, hip and abdomen covering body section for said one leg side of the wearer's body;

a second upper thigh, abdomen and hip covering body section for the opposite side of the wearer's body;

a waistband to which upper ends of said sections are attached;

upper portions of said sections being connected together for a limited vertical distance adjacent to said waistband;

an elastic crotch gusset piece connected to and between the remaining lower portions of said sections and coacting with said sections to effect substantially uniformly tensioned engagement of said sections and said gusset piece



entirely about each of the wearer's upper thighs, and in the hip, groin and abdomen areas;

said gusset piece and said second section defining between them a downward leg opening through which the remaining leg of a wearer extends;

said gusset piece and said second section each providing a substantial circumferential part of an edge for said leg opening and which edge engages in completely encircling relation about the upper thigh of said remaining leg of the wearer to restrain upward creeping of said second section;

and said gusset piece being dimensioned both vertically and horizontally to engage supportingly with the wearer's inner thigh and groin and being cooperative in mutually tensioning relation with said second section for efficient vericose vein support for the groin and the completely encircled upper thigh of the wearer's engaged leg, as well as the hip and abdomen areas.

4,106,515

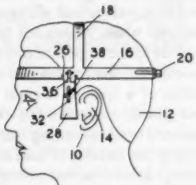
SIDE BURN TRIMMING GUIDE

David Miller, 166 Bristol Ferry Rd., Portsmouth, R.I. 02871

Filed Feb. 7, 1977, Ser. No. 766,089

Int. Cl.[2] A45D *24/36*

U.S. Cl. 132—45 R **7 Claims**



1. A side burn trimming guide appliance, comprising an annular first band circumscribing the head, a pitch controlling second band secured to said first band at diametrically opposed points, an arm depending from said first band, a threaded shaft extending substantially perpendicularly from said arm, a plurality of raised spaced apart protrusions disposed in an arc on said first band above said arm, at least one elongated template removably attachable to said arm, said template defining an aperture, a neck of reduced width being located on one distal end of said template, said shaft mating with said aperture, said neck being dimensioned to be selectively positioned between any adjacent two of said plurality of protrusions to permit angular positioning of said template about said shaft, means engaging said shaft for securing said template to said arm.

4,106,516

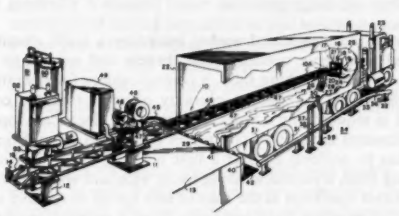
INTERNAL WASH CLEANER FOR TRUCK TRAILERS AND BODIES

Paul C. Wiegand, 4008 Harlanwood Dr., Fort Worth, Tex. 76109

Continuation-in-part of Ser. No. 517,167, Oct. 23, 1974, abandoned. This application Feb. 24, 1976, Ser. No. 660,797

Int. Cl.[2] B08B *3/04*; B60S *3/00*; B08B *9/00*

U.S. Cl. 134—45 **12 Claims**

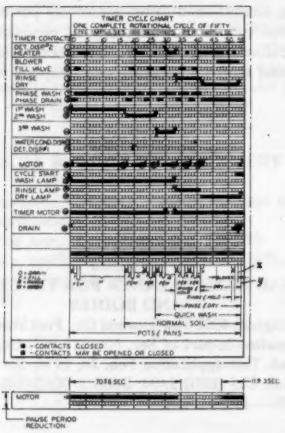


1. In an internal washing system for truck cargo carrier enclosures open to the rear: multi-section extendable and retractable boom means; boom structure mounting means; fluid spray washing head means mounted on fore extendable end structure of said boom means; drive means of said boom means driving said boom fore extendable end and the washing head means in extension into the interior, and in retraction back out of said truck enclosure; fluid delivery system means interconnecting fluid source means and spray outlet means of said fluid spray washing head means; and washing cycle control means with selective fluid delivery control means operating said fluid source means and said fluid delivery system means in distinct cyclic operation sequential steps; said washing cycle control means comprising first switching means selectively operable to energize said drive means to effect boom extension into said cargo carrier enclosure and in circuit with said fluid delivery system control means to effect delivery of a mixture of detergent and water to said washing head means, second switching means responsive to a predetermined boom extension into said cargo carrier enclosure to effect de-energization of said drive means and in circuit with said fluid delivery system to effect a shut-off of detergent supply to said fluid mixture, time delayed switching means responsive to activation of said second switching means, and in circuit with said drive means, to energize said drive means in a reverse direction to effect retraction of said boom, and said further switching means responsive to full retraction of said boom and in circuit with said fluid delivery system, to de-energize said drive means and shut off said fluid delivery, thereby completing a washing cycle.

4,106,517
DISHWASHER CONTROL SYSTEM WITH CYCLE RESELECT

Carl J. Wright, Bellbrook, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 21, 1977, Ser. No. 835,219
Int. Cl.[2] B08B 3/02
U.S. Cl. 134—58 D 1 Claim

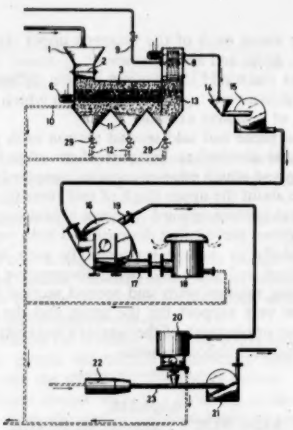


1. In an automatic dishwasher including a wash chamber adapted to receive washing fluid therein and articles to be cleaned by said washing fluid, a control system for operating said dishwasher including a plurality of timer switches controlled in sequence by a timer, a plurality of electrically operated elements including drain means controlled by said timer switches to perform at least a first washing cycle with said washing fluid, a second washing cycle with said washing fluid and a drain operation at the start of said cycles to remove any residue of washing fluid remaining from a previous washing cycle; an electrical power source for said control system; said timer electrically connected to said power source, said timer including a normal advance motor operative to drive said timer switches in said sequence in a first predetermined period of time and a rapid advance motor operative to drive said timer switches in said sequence in a second predetermined period of time relatively shorter than said first predetermined period, manually operated washing cycle selector switch means in said control system, said cycle selector switch means including a separate actuating member for selecting each of the cycles, each actuating member having a latched position and a momentary position for initiating operation of the selected cycle upon being moved by the user through said latched position to said momentary position and upon release by said user being returned to said latched position, whereby a momentary switch is closed momentarily causing said rapid advance motor to be energized to rapid advance said timer switches in said sequence to the start of the selected cycle and to preset said selector switch means for cooperation with said timer switches in operating the dishwasher through the selected cycle, the improvement wherein said timer switches include an overriding drain timer switch operative at one interval in said sequence to bypass said cycle selector switch means and said rapid advance motor to energize said normal advance motor and said drain means at the end of said cycles, and said selector switch means includes a cancel-reset actuating member having a latched position and operative therein to cancel out the remaining portion of any previously selected cycle by energizing said rapid advance motor to rapid advance said timer switches through said sequence to said one point, whereupon said rapid advance motor is deenergized, said drain timer switch initiating a drain operation by energizing said drain means to remove said washing fluid from said selected cycle and energizing said normal advance motor to control said timer switches during said drain operation to drain the wash chamber of said washing fluid and then deenergizing said drain means and the normal advance timer motor to terminate said selected cycle, and whereby during said drain operation the user may without waiting manually move a substitute actucting member of the selector switch means through its first latched position to its momentary position to initially close said momentary switch such that said rapid advance motor will rapid advance said timer switches through said one interval in said sequence to the start of said substitute cycle so that timer switches other than said drain timer switch may continue the drain operation at the start of said substitute cycle which was initiated by said drain timer switch at the end of said selected cycle, thereby to preclude any residue of washing fluid in said wash chamber either at the end or the start of said washing cycles.

4,106,518
APPARATUS FOR WASHING GROSSLY SOILED PRODUCTS OF PLASTIC MATERIAL FOR SUBSEQUENT RE-USE

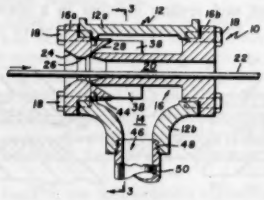
Heinrich Buzga, Grevenbroich; Werner Steprath, Dormagen, and Kurt Pause, Bosau Uber Eutin, all of Fed. Rep. of Germany, assignors to Maschinenfabrik Buckau Aktiengesellschaft, Grevenbroich, Fed. Rep. of Germany

Division of Ser. No. 694,550, Jun. 10, 1976, Pat. No. 4,073,661.
This application Jan. 6, 1977, Ser. No. 760,135
Claims priority, application Fed. Rep. of Germany, Jun. 10, 1975, 2525750; Jun. 10, 1975, 2525749
Int. Cl.[2] B08B 3/12
U.S. Cl. 134—104 21 Claims



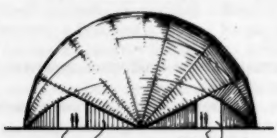
1. Washing apparatus for washing soiled comminuted products of plastic material, such as sheets, bands, sacks or the like, comprising an elongated container having at least one downwardly extending funnel-shaped bottom portion closed at a lower end thereof by a valve, said elongated container having a pair of opposite end walls; means for feeding soiled comminuted plastic material in the region of one of said end walls into said container; means for maintaining in said container a bath of washing solution of a specific weight greater than that of said comminuted plastic material fed thereinto; a partition adjacent the other end wall extending into the bath of washing solution and dividing the interior of said container in a washing zone and a discharge zone adapted to communicate with each other adjacent the container bottom; means for agitating the washing solution and the comminuted plastic material in said washing zone; and means for removing said comminuted plastic material from said discharge zone.

4,106,519
VANE-TYPE NOZZLE ASSEMBLY
Asjed A. Jalil, Holden, and C. Allen Rich, Southboro, both of Mass., assignors to Morgan Construction Company, Worcester, Mass.
Continuation of Ser. No. 497,030, Aug. 13, 1974, abandoned, which is a continuation of Ser. No. 353,496, Apr. 23, 1973, abandoned. This application Dec. 15, 1976, Ser. No. 750,760
Int. Cl.[2] B08B 3/02
U.S. Cl. 134—122 R 1 Claim



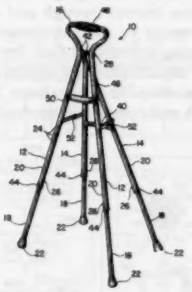
1. Apparatus for applying a liquid to the surface of an axially moving elongated element, said apparatus comprising: a housing including first and second communicating tubular sections arranged in a generally T-shaped configuration, said first tubular section defining an interior chamber; guide means for defining a passageway extending longitudinally through said chamber, said guide means including mating elements protruding into said chamber from opposite ends of said first tubular section, said passageway being suitably dimensioned and adapted to accommodate movement therethrough of an elongated element; inlet means in said second tubular section for admitting liquid into said chamber; the adjacent ends of said mating elements being spaced to define an orifice which surrounds said passageway and through which liquid flows from said chamber into said passageway for application to the surface of the elongated element moving axially therethrough, one of said mating element being provided at a location adjacent to said orifice with a plurality of slots arranged radially in relation to the longitudinal axis of said passageway; and vane means for directing the flow of liquid into said orifice, said vane means comprising flat plate members seated in said slots and protruding therefrom at said orifice into said chamber.

4,106,520
ENCLOSURE
Gerhardt Allan Warner, and Kurt Ehrich Warner, both of 97 Canora Street, Winnipeg, Manitoba, Canada
Filed May 16, 1977, Ser. No. 797,520
Claims priority, application United Kingdom, Oct. 5, 1976, 41287/76
Int. Cl.[2] A45F 1/16
U.S. Cl. 135—4 R 9 Claims



1. An enclosure structure for erection upon a supporting surface and comprising in combination at least two sets of arched support ribs and a flexible cover for said support ribs, means for each set of support ribs pivoting the adjacent ends of each set of support ribs on common loci, each set of support ribs being situated in angular relationship to one another whereby said means pivoting the adjacent ends of each set of support ribs have different pivot axes, and means clamping some of said support ribs of one set of support ribs to some of said support ribs of the other set of support ribs at the intersections thereof.

4,106,521
COLLAPSIBLE CANE APPARATUS
Morton I. Thomas, Nyack, N.Y., assignor to Temco Products, Inc., Passaic, N.J.
Filed May 23, 1977, Ser. No. 799,397
Int. Cl.[2] F16M 13/08
U.S. Cl. 135—67 8 Claims



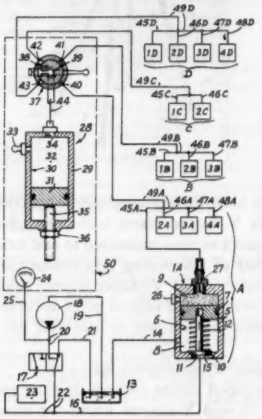
1. A single hand folding cane apparatus comprising:
a generally V-shaped frame including a handle section, a central pivot section connected to said handle section, and a first pair of telescoping legs connected to said central pivot section, said V-shaped frame having a relatively narrow waist at the central pivot section with respect to said handle section and to said first pair of telescoping legs;
a second pair of telescoping legs; and,
a common pivot means passing through said central pivot section of said V-shaped frame for connecting said V-shaped frame and said second pair of legs together in a divergent manner so as to form an expandable pyramid-like base for said cane apparatus in which said common pivot means forms the apex of said pyramid-like base,
whereby a downward force applied to the handle section is concentrated at the central pivot section through said common pivot means and into said first and second pair of telescoping legs and whereby the stability of the apparatus increases as the first and second pair of telescoping legs are extended due to the substantial divergent spreading of the legs in two dimensions during the extension process.

4,106,522
PRESSURE RELIEF VALVE
Jean-Pierre André Manesse, Senlis, France, assignor to Poclain, Societe Anonyme, Belleville, France
Filed Feb. 14, 1977, Ser. No. 768,185
Claims priority, application France, Mar. 5, 1976, 76 06381
Int. Cl.[2] F16K 17/06
U.S. Cl. 137—512 2 Claims

1. A pressure regulator mechanism for calibrating relief valves comprising at least two relief valves whose maximum operating pressures are selected to have different valves, each of said valves including a valve body having an internal bore, an opening and a valve seat about said opening formed therein; a piston movably positioned in said bore and separating the bore into an adjustment chamber and an exhaust chamber; said exhaust chamber being in communication with said opening; a movable closure member in said exhaust chamber positioned to selectively engage said seat to open and close said opening; and resilient means in said exhaust chamber operatively engaged between said piston and closure member for normally biasing

said closure member into engagement with said seat to close said opening;

means for adjusting the position of said pistons in said bores including, a source of incompressible fluid, separate conduits for sep rately connecting said source of incompressible fluid to said adjustment chambers; non-return valve means connected between said conduits and said adjustment chambers for permitting incompressible fluid to enter said adjustment chambers from their associated conduits and preventing incompressible fluid from passing from the adjustment chambers to the associated conduits; and means for selectively urging said incompressible fluid from said source thereof through said conduits and non-return valve means to said adjustment chamber; a use circuit containing pressurized fluid for operating a work member; said use circuit being operatively connected in fluid communication to the exhaust chambers of said valves through said openings whereby the pressure of the



pressurized fluid in the use conduit connected to the valves is limited by the valve;

manometer means operatively connected to said use circuit for measuring the pressure of the pressurized fluid therein; said manometer means being located in proximity to said source of incompressible fluid; and

selector means for selectively connecting and supplying said incompressible fluid from said source thereof to the respective supply conduits associated with said valves to selectively supply said incompressible fluid to the valves and thereby adjust the position of the piston therein in order to adjust the limiting pressure applied by the valve on the pressurized fluid of the use circuit;

said valves each including an exhaust port communicating with said exhaust chamber whereby when the pressure in said user circuit rises above the limiting pressure applied by the valve the closure member is moved away from said valve seat against the bias of said resilient means to open said pressure circuit to exhaust through said exhaust port.

4,106,523

INTERCONNECT DEVICE FOR USE IN CLOSED FLUID CIRCULATING SYSTEMS

David Charles Thornton, Harrisburg; Linn Stephen Lightner, Camp Hill, and Patrick Edward Lannan, Harrisburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 501,541, Aug. 29, 1974, Pat. No. 3,917,370. This application Apr. 24, 1975, Ser. No. 571,129

Int. Cl.[2] F16K *29/00*

U.S. Cl. 137—614.04 **2 Claims**

1. An interconnect device for conduits of closed fluid circulating systems comprising:

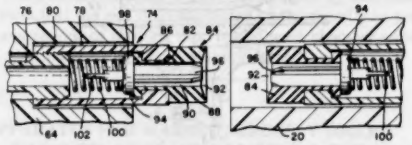
a pair of mating hermaphroditic members each comprising:

a body having a bore extending therethrough;

means on one end of said body for fixed connection of said bore to associate conduits;

a resilient sealing member fixedly mounted on said body extending from the opposite end thereof and having a bore coaxial with and forming an extension of the bore in said body;

a valve member movably mounted in said body, said valve member having a head portion adopted to engage said sealing member and an integral stem lying entirely within the bore of said sealing member in a normally closed condition, a stop integral with each valve head portion



and extending in the opposite direction from said stem; and

spring means biasing said valve head portion against said seal;

whereby relative movement of said mating members towards one another causes a sealing engagement to be established between said sealing members prior to said valve stems engaging to move the associated valve head portions away from said sealing members to allow fluid flow through said coupled members, each said stop limiting opening movement of the respective valve member to less than the mating movement of said device thereby assuring opening of both valve members.

4,106,524

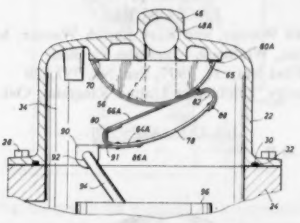
LOW ACTUATION FORCE FLUID VALVE APPARATUS

Walter G. Wunsch, Erie, Pa., assignor to Geosource Inc., Houston, Tex.

Filed Jul. 27, 1976, Ser. No. 709,172

Int. Cl.[2] F16K *7/18*

U.S. Cl. 137—625.44 **4 Claims**



1. A low actuation force fluid valve apparatus comprising:

a valve housing;

a stationary member having an arcuate surface thereon mounted within said housing;

a fluid port extending through said stationary member;

a flexible valve band having a first and a second surface thereon flexibly movable from a first, closed, position to a second, open, position in response to an actuating force;

a substantially T-shaped actuating member having the edge of the crossbar and the edge of the leg being curved toward each other under the body of the T, said flexible valve band being connected to one of the edges of the T-shaped member, said actuating member being pivotally movable relative to said stationary member to transmit an actuating force to said flexible valve band to move said

flexible valve band from the first, closed, position to the second, open, position;

said valve band in the first, closed, position having said first surface adjacent to the surface of said stationary member to cover said fluid port, said valve band being subjected to a compressive load on said first surface thereof and a tensile load on said second surface thereof while in the first, closed position,

said valve band in the second, open, position extending tangentially from the surface of said stationary member to uncover said fluid port, said valve band being subjected only to a tangentially directed tensile force while in the second, open, position; and,

a flexible guide band having first and second surfaces thereon and being connected to the other edge of said T-shaped actuating member for movement in response to an actuating force from a first to a second position, connection of said T-shaped actuating member to said valve band and said guide band compressing said T-shaped member across its ends to generate a bend therein to impart a tensioning force to said valve band and said guide band;

said guide band in the first position extending tangentially from the surface of said stationary member and being subjected only to a tangentially directed tensile force;

said guide band in the second position having said first surface thereof disposed adjacent to the surface of said stationary member, said guide band being subjected to a compressive load on said first surface thereof and a tensile load on said second surface thereof while in the second position.

4,106,525

FLUID PRESSURE CONTROL

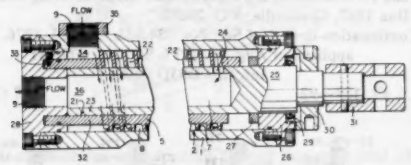
John Alexander Currie, Paisley; Maurice McKenna, and John Howard Upton, both of East Kilbride, all of Scotland, assignors to The Secretary of State for Industry in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Feb. 14, 1977, Ser. No. 768,628

Claims priority, application United Kingdom, Feb. 20, 1976, 6883/76

Int. Cl.[2] F15D *1/02*

U.S. Cl. 138—43 **2 Claims**



1. A fluid flow restrictor comprising a housing adapted for attachment between a first and a second length of a pipeline, said housing having an internal helical duct arranged in fluid communication with the said first length of pipeline, a series of fluid transfer ports regularly disposed along the length of said helical duct so as to provide fluid communication between said helical duct and said axial duct, and a sleeve having an axial duct coaxially located within said helical duct and arranged in fluid communication with said second length of pipeline being adapted to rotate and which is in the form of a hollow cylinder fitted coaxially within said helical duct in fluid-tight proximity with the walls thereof so as to close said fluid transfer ports, said sleeve being provided with at least one radial aperture disposed along the length of the sleeve in the form of a single-turn helix, which aperture is successively alignable with every one of said fluid transfer ports by rotation of said sleeve through no more than one complete revolution thereby to permit selective opening of any one of said fluid transfer ports to said axial duct so as to vary the effective path length of said helical duct.

4,106,526

HIGH TEMPERATURE END FITTING

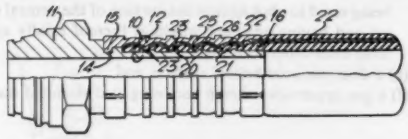
Charles Szentmihaly, Salisbury, England, assignor to BTR Industries Limited, London, England

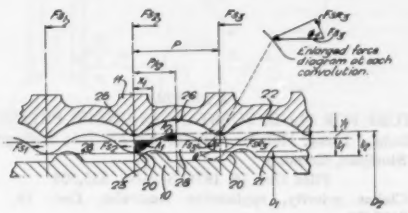
Filed Apr. 5, 1977, Ser. No. 784,910

Claims priority, application United Kingdom, Apr. 8, 1976, 14375/76

Int. Cl.[2] F16L *11/08, 33/20*

U.S. Cl. 138—109 **8 Claims**





1. A hose end unit comprising a hose end portion consisting of an inner cylindrical elastomeric liner extending to the free end of the hose end portion and a reinforcement layer surrounding the liner, and an end fitting of the kind comprising an insert to enter into the hose end portion and a ferrule to surround the hose end portion, a plurality of radially inward projections being provided on the ferrule and a plurality of radially outward projections being provided on the insert, the ferrule being swaged around the insert so that the hose end portion is gripped between the insert and the ferrule, wherein the arrangement including the shape of the projections on the ferrule being such that the reinforcement layer lies against the ferrule and the dimensions of the projections on the insert and the ferrule are such that material of the liner is confined in cells delimited by annular gaps between the reinforcement and the projections on the insert, space between the reinforcement layer and the insert in between two said gaps being completely filled by liner material under compression and the gaps being sufficiently narrow to substantially prevent flow of the material of the elastomeric liner between adjacent cells in use.

4,106,527

REINFORCED FLEXIBLE CONDUIT AND METHOD OF MANUFACTURE

Erich Schmidt, Hoffeldstrasse 45a, 4 Dusseldorf, Germany

Filed Oct. 10, 1974, Ser. No. 513,823

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1973, 2350833

Int. Cl.[2] F16L *11/00*

U.S. Cl. 138—131 **3 Claims**

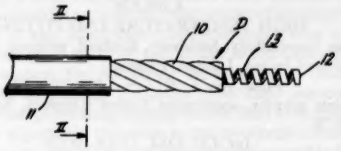
1. A flexible conduit for conducting oxygen and for combustion therewith including

(a) a plurality of metallic strands twisted together to form

(b) a stranded duct having

(c) a central channel therein access means for providing access for oxygen within said central channel to penetrate the stranded duct, said access means including

(d) a helical metal insert in said central channel, said insert



being sized to abut against the surface of the central channel and having adjacent windings thereof axially spaced from each other to form

(e) a discontinuous helical surface, and

(f) a gas impervious sheath enclosing said stranded duct.

4,106,528

TUBE FOR FLUID SUBSTANCES UNDER PRESSURE

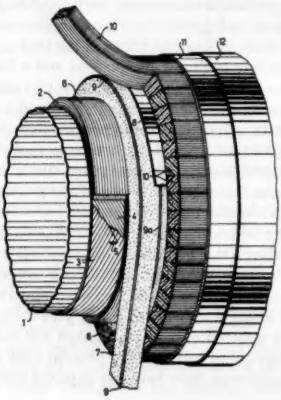
Nikolaus Laing, Hofener Weg 35 bis 37, 7141 Aldingen bei Stuttgart, Germany

Filed Dec. 16, 1974, Ser. No. 533,308

Claims priority, application Australia, Dec. 19, 1973, 210625/73

Int. Cl.[2] F16L *9/14*

U.S. Cl. 138—149 **21 Claims**



1. A pressure tube for the transport of fluid under pressure comprising a plurality of superimposed tubular layers including an inner thin-walled fluid impervious metal tubular layer, an outer tubular layer comprising windings of yarns formed from mineral fibers where said yarns carry the hoop stresses of the pressure tube resulting from the fluid under pressure, a porous insulating layer overlying said windings, axially extending yarns for carrying axial stresses positioned radially outwardly of said insulating layer, and a hermetically sealed tubular wall positioned between the layer of insulating material and the axially extending yarns and wherein the space between the hermetically sealed tubular wall and said metal tubular layer is evacuated.

4,106,529

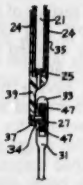
HEDDLE FRAME

Frank H. Kaufmann, Greenville, S.C., assignor to Steel Heddle Manufacturing Company, Greenville, S.C.

Filed Oct. 22, 1976, Ser. No. 734,823

Int. Cl.[2] D03C *9/06*

U.S. Cl. 139—92 **5 Claims**



1. In a heddle frame having top and bottom rails, heddle supporting rods carried in said frame and heddles having end eyes carried on said rods, the improvement in said heddle supporting rods which comprises

a central metallic rod portion having

longitudinally extending non-metallic portions of less impact noise response in covering relation to the upper and lower edges of said metallic rod portion for contact with the interiors of said end eyes for reducing impact noise.

4,106,530

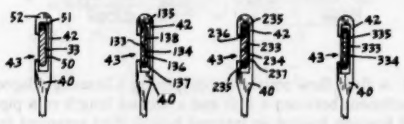
HEDDLE FRAME

Frank H. Kaufmann, c/o Steel Heddle Manufacturing Co., P.O. Box 1867, Greenville, S.C. 29602

Continuation-in-part of Ser. No. 734,823, Oct. 22, 1976. This application Aug. 24, 1977, Ser. No. 827,441

Int. Cl.[2] D03D *9/00*

U.S. Cl. 139—92 **7 Claims**



1. In a heddle frame having top and bottom frame rails, heddle supporting rods carried on said frame and heddles having end eyes carried on said rods, the improvement in said heddle supporting rods which comprises

an upper rod with a central rod portion and having an upper edge portion for engagement with the upper end margin of the upper end eye and a lower rod with a central rod portion and having a lower edge portion for engagement with the lower margin of the lower end eye, and

each of said edge portions comprises a longitudinally extending non-metallic non-ceramic portion of less impact noise response for reducing impact noise.

4,106,531

KNIT-WOVEN FABRIC SELVAGE STRUCTURE, AND APPARATUS FOR PRODUCING THE SAME

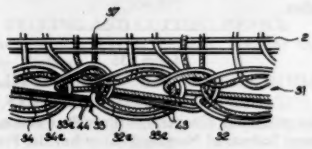
Oldrich Horsček, Liberec; Frantisek Silar, Vratislavice n/Nisou, and Dalibor Rychlík, Liberec, all of Czechoslovakia, assignors to Statni vyzkumny ustav textilni Liberec, Liberec, Czechoslovakia

Filed Sep. 1, 1977, Ser. No. 829,887

Claims priority, application Czechoslovakia, Sep. 7, 1976, 5785-76

Int. Cl.² D03D *23/00, 25/00*

U.S. Cl. 139—383 B 6 Claims



1. A selvage structure of a knit-woven fabric produced in a warp-knit structure from weft thread loops and comprising spaced apart stitch wales with warp thread groups disposed therebetween, said warp threads being interlaced with stitch connecting loops to form a weave while the fabric selvage consists of a weft thread and a marginal weft thread, comprising marginal wale built by mutually binding stitches from a weft thread, stitches from a marginal weft thread, and stitches from a lock thread.

4,106,532

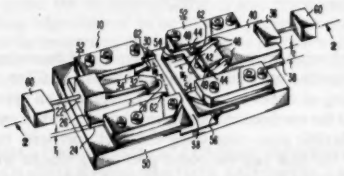
MACHINE FOR STRAIGHTENING THE WIRE LEADS OF A DEVICE

Nicholas Francis Gubitose, Moosic, and Robert Arthur James, Hunlock Creek, both of Pa., assignors to RCA Corporation, New York, N.Y.

Filed Jun. 6, 1977, Ser. No. 804,006

Int. Cl.² B21F *1/02*

U.S. Cl. 140—147 10 Claims



1. A machine for straightening at least one wire lead of a device wherein the leads extend in the same general direction when there is a plurality of leads comprising:

a first jaw slidably affixed to a base, said first jaw having a leading edge which has at least one V-shaped groove therein, said first jaw being relatively thin with respect to the length of said lead;

a second jaw slidably affixed to said base in an opposing relation to said first jaw, said first and second jaws being affixed to said base in such a fashion that the movement thereof is only in a single geometric plane, said second jaw having a leading edge which is proximate said leading edge of said first jaw, said leading edge of said second jaw having at least one V-shaped groove therein each substantially aligned with a corresponding one of said V-shaped grooves of said first jaw, said second jaw being affixed to said base such that said first jaw can slide thereunder, and

means for moving said jaws toward each other such that said jaws mesh with each other to contact and straighten said lead or leads.

4,106,533

APPARATUS FOR AND A METHOD OF INTRODUCING COMBUSTIBLE PARTICULATE MATERIAL INTO A PRESSURIZED GASIFYING VESSEL

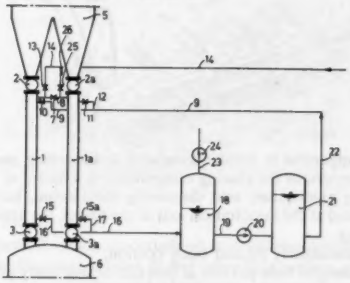
Alfred Herzig, Essen, Del.X, assignor to Krupp-Koppers GmbH, Essen, Fed. Rep. of Germany

Filed Dec. 8, 1976, Ser. No. 749,712

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1975, 2556162

Int. Cl.² B65B *1/16*

U.S. Cl. 141—1 18 Claims



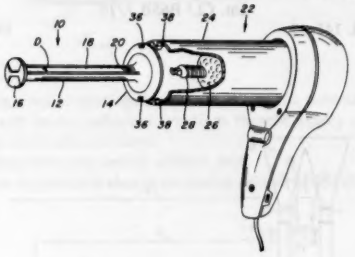
1. A method of operating an arrangement for introducing bulk material into a vessel, particularly combustible particulate material into a gasifying vessel, of the type having two conveying tubes arranged in parallel, a diaphragm member in each of the conveying tubes and subdividing the interior of the same into a first compartment communicating with a supply of the material and with the vessel, and a second compartment surrounding said first compartment and communicating with a source of control medium, first valves between the supply and the first compartments, second valves between the first compartments and the vessel, a source of pressurized fluid communicating with the first compartments, third valves between the source of presurized fluid and the first compartments, a conduit communicating the first compartments, and a fourth valve interposed in the conduit, the method comprising the steps of withdrawing the control medium to increase the volume of the first compartment of one of the conveying tubes; opening the associated first valve to admit the material from said supply into said first compartment; closing said associated first valve; equalizing the pressure in said first compartment with that in the vessel by opening said third and fourth valves thus admitting the pressurized fluid from said first compartment of the other conveying tube through said conduit and from said source of pressurized fluid; closing said fourth valve opening the associated second valve to discharge the pressurized contents of said first compartment into the vessel; continuing said admission of the pressurized fluid from said source into said first compartment to enhance the discharge of the material into the vessel; simultaneously forcing the control fluid at elevated pressure into the associated second compartment to reduce the volume of said first compartment; closing said second valve; opening said fourth valve during said forcing step to admit the pressurized fluid from said first compartment into the first compartment of the other conveying tube; closing said fourth valve prior to the opening of said first valve; and subsequently increasing the volume of said first compartment of the one conveying tube.

4,106,534

APPARATUS FOR PLACING COMESTIBLES IN DISPENSING MECHANISM

Marshall B. Johnson, Chillicothe, Ohio, assignor to Wear-Ever Aluminum, Inc., Chillicothe, Ohio

Filed Jun. 14, 1976, Ser. No. 695,464
Int. Cl.[2] B65B *3/10*
U.S. Cl. 141—18 **4 Claims**



1. An apparatus in combination with a dispensing mechansim, the apparatus for placing comestibles in a barrel of a said dispensing mechanism, said dispensing mechanism, having a shaft located at the longitudinal axis of the barrel, the apparatus comprising:

(a) a substantially tubular body portion;

(b) an integral base portion at one end of said body portion, said base portion having a hole therethrough substantially aligned with the longitudinal axis of said body portion, the hole being larger than the shaft for receiving therethrough the end of the shaft of the dispensing mechanism into said tubular body and the outer configuration of said base portion being substantially identical to the noncircular cross section of the barrel of the dispensing mechanism;

(c) an integral head portion at the other end of said body portion, said head including a means for gripping; and

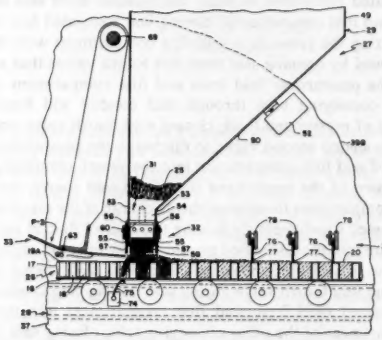
(d) means on said tubular body for permitting access to within said tubular body for cleaning includes a longitudinal opening extending along the length of said tubular body.

4,106,535

APPARATUS FOR FILLING THE CELLS OF AN EXPANDED CELLULAR CORE MEMBER WITH GRANULAR INSULATION

Bernard Harpley Davis, Stoney Creek, Canada, assignor to H. H. Robertson Company, Pittsburgh, Pa.

Filed Feb. 23, 1976, Ser. No. 660,014
Int. Cl.[2] B65B *1/04*
U.S. Cl. 141—88 **14 Claims**



1. In apparatus for filling cells of an expanded cellular core member with granular insulation, said core member having a base sheet secured to and capping lower ends of said cells, said apparatus including horizontally disposed conveyor means arranged to transport said core member along a rectilinear path of travel, and hopper means positioned above said conveyor means, having a lower discharge opening therein proximate to said conveyor means, the improvement comprising:

adjustable barrier means for adjusting the cross-sectional area of said discharge opening;

valve means controlling the flow of said granular insulation through said discharge opening; and

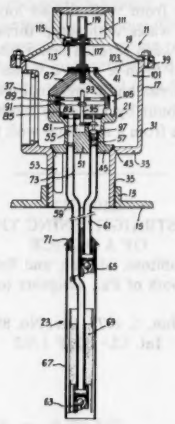
horizontal path means disposed beneath said conveyor means, receiving excess granular insulation from said core member.

4,106,536

SELF-ACTING DEVICE FOR STOPPING FILLING OF TANKS WITH FLUID PRODUCTS

Michel Jacques Léon Coquerel, Villerville, France, assignor to Equipment Industriel Normand, Grentheville, France

Filed Sep. 20, 1976, Ser. No. 724,937
Int. Cl.[2] B65B *57/14*
U.S. Cl. 141—220 **14 Claims**



1. Mechanism for a self-acting stoppage of decanting operation of liquids from a filling tank to a vat to be filled, the tank comprising an outlet valve, the vat comprising an upper filling inlet, and the mechanism having an inlet port and an outlet port with a flexible pipe connecting the inlet port with the outlet valve of the tank and the outlet port being placed within the vat for flowing liquid therein, said mechanism comprising:

a body with an inlet and an outlet respectively communicating with said inlet port and outlet port,

a flexible membrane mounted in the body and delimiting therein an upper chamber and a lower chamber, the lower chamber communicating with the inlet of said body,

main valve means mechanically connected to the membrane and pendant therefrom to control opening of the inlet of said body whereby liquid coming from the filling tank through the outlet valve and the flexible pipe and the inlet port of the mechanism and the inlet of said body into the lower chamber raises the membrane and opens said main valve means, liquid then flowing through said outlet port in said vat,

second valve means connected both to the lower chamber and to the upper chamber of said body and controling communication therebetween,

a float placed in the vat for controling said second valve means at a first predetermined level in the vat, whereby when the liquid flowing in the vat through the main valve means reaches said first predetermined level, said second

valve means is closed and causes liquid to flow from the lower chamber into the upper chamber so to balance the liquid on the flexible membrane which goes down with the main valve, said main valve being then closed and interrupting flowing of the liquid therethrough,

third valve means mounted between the lower chamber and said outlet, and controled by the second valve means to be opened when both said second valve means and outlet valve are closed and the flexible pipe is dismounted from the filing tank, whereby liquid contained in the flexible pipe and in the lower chamber can flow into the vat.

4,106,537

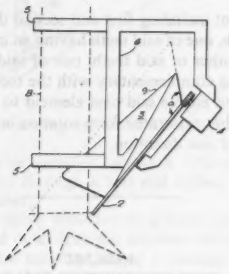
FELLING AND CUTTING DEVICE

Antti Tuomas Saikku, Ulvila, Finland, assignor to Rauma-Repola Oy, Finland

Continuation-in-part of Ser. No. 747,472, Dec. 3, 1976, abandoned, Continuation-in-part of Ser. No. 747,472, Dec. 3, 1976, abandoned. This application Jan. 24, 1977, Ser. No. 762,192

Int. Cl.[2] A01G *23/08*

U.S. Cl. 144—34 R **6 Claims**



1. A device for cutting or felling a tree comprising:

(a) a rotatable base disk, and

(b) a curved cutting blade of increasing width in the shape of partial truncated cone mounted along a portion of the periphery of the base disk, said disk constituting a truncating plane, the increasing width of said blade causing the cutting edge thereof to be located progressively farther from the truncating plane, the widest portion of the blade having an edge constituting a rear edge extending abruptly downward to the surface of the base disk.

4,106,538

TRANSLATORY FEED OF LUMBER WORKPIECES FROM AN ORIENTING STATION THROUGH AN EDGE TRIMMING STATION

F.S. Meinrad Sigfridsson, Huskvarna, and K. Sigvard Jansson, Tyresö, both of Sweden, assignors to Saab-Scania Aktiebolag, Linkoping, Sweden

Filed Apr. 4, 1977, Ser. No. 784,289

Claims priority, application Sweden, Apr. 7, 1976, 7604057

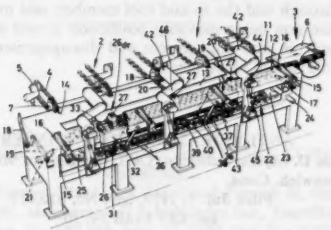
Int. Cl.[2] B27M *1/08;* **B27B** *31/00;* **B27C** *1/12*

U.S. Cl. 144—309 R **8 Claims**

1. The method of effecting translatory substantially lengthwise motion of an elongated workpiece such as a cant or a slab that has opposite top and bottom face surfaces, at least one of which is substantially flat, to feed the workpiece in a horizontal direction from an orienting station at which the workpiece is established in a predetermined orientation with its said one face surface substantially horizontal, into a cutting station at which straight and parallel cuts transverse to said one face surface are made along the length of the workpiece while its predetermined orientation is accurately maintained notwithstanding cutting forces which tend to disturb that orientation, said method being characterized by:

A. establishing the workpiece, in its said orientation, in vertical force transmitting relationship to force applying means by which said one face surface of the workpiece is engaged across the major portion of its width at each of a plurality of locations spaced along its length, and by which the workpiece can be confined against vertical motion in the direction of its said one face surface while being left free for movement in said horizontal direction;

B. while maintaining said force transmitting relationship, and by effecting translatory vertical relative motion between said force applying means and horizontally movable driving means, establishing forceful engagement between said driving means and a plurality of areas of the opposite face surface of the workpiece at locations



thereon which are confined to a narrow lengthwise extending central zone of said other face surface, are spaced from one another along said zone, and are of such limited extent that the driving means is incapable of preventing tilting of the workpiece without cooperation of the force applying means but, owing to said forceful engagement, has sufficient friction with the workpiece that the workpiece is constrained to partake of all motion of the driving means; and

C. while maintaining the workpiece clampingly confined between the force applying means and the driving means, constraining the driving means to straight-line horizontal motion in said direction.

4,106,539

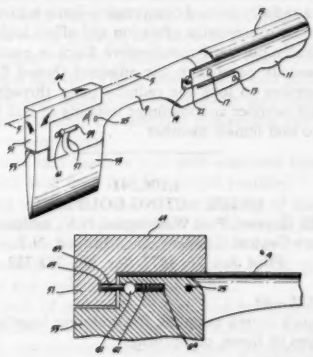
FOLDING HATCHET

Walter R. Petrich, 621 N. Yale, Fullerton, Calif. 92631

Continuation-in-part of Ser. No. 714,611, Aug. 16, 1976, abandoned. This application Apr. 18, 1977, Ser. No. 788,316

Int. Cl.[2] B26B *23/00*

U.S. Cl. 145—2 A **7 Claims**



1. In a folding hand tool wherein a tool member is rotatably attached to a channel handle member, the improvement comprising:

a tool member having a working position and a folded posi-

tion, said tool member having a receptacle therein adapted to receive a pin in sliding engagement therewith, said tool member having a slot therein which opens into said receptacle;

rigid block means attached to the channel member and having a hole thereon adapted to receive and engage a pin;

a pin slideably mounted in said receptacle of said tool member, said pin engaging said hole of said block means when said tool member is rotated into said working position thereby locking said tool member in a fixed position with respect to the channel handle member, said pin disengaging said hole of said block means thereby unlocking said tool member from said block means for rotating said tool member into said folded position; and

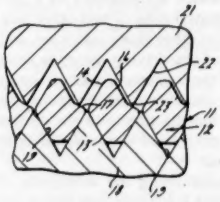
a manual extension arm attached to said pin and extending through said slot in said tool member, said manual extension arm being movably positioned in said slot to move said pin into engagement and disengagement with said hole in said block means.

4,106,540

ANTI-VIBRATION THREAD INSERT

William D. Myers, Fullerton, Calif., assignor to Microdot, Inc., Greenwich, Conn.

Filed Jul. 7, 1977, Ser. No. 813,679
Int. Cl.[2] F16B *39/30*
U.S. Cl. 151—14 CS **3 Claims**



1. A coiled wire insert for insertion in a threaded female member comprising a preformed wire of generally diamond-shaped cross-section, said wire being formed into a coil having an outer thread form complimentary to the flank angles of and mateable with the thread of a female member and an inner thread, one face of the inner thread having a ramp at the thread root between the convolutions of said insert and angled at approximately 30° to the central axis of said insert, the crest of the thread on a male member thread being engageable with the ramp on said insert when said male member is axially loaded whereby a radially inward compressive force is exerted on said male member to minimize vibration and effect locking thereof and a radially outward compressive force is exerted on said insert generally parallel to the adjacent thread flank of said female member to lock the radially outer threads thereof in said female member and minimize twisting of said thread form relative to said female member.

4,106,541

QUICK ACTING COUPLING

William H. Gravert, Port Washington, N.Y., assignor to Marine Moisture Control Company, Inc., Inwood, N.Y.

Filed Jan. 26, 1977, Ser. No. 762,739
Int. Cl.[2] F16L *23/02*
U.S. Cl. 151—48 **12 Claims**

1. A quick acting coupling for coupling together a pair of heavy pipes or hoses, comprising:

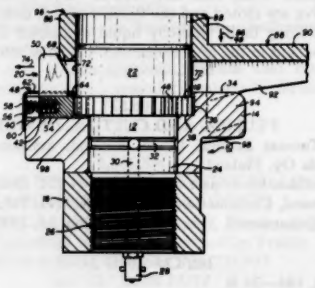
a clamp support;

a bolt threadedly received within and coupled to said clamp support, said bolt including a shank portion;

a rotable cam element rotatable about said bolt and held to said clamp support as a unit; and,

releasable locking means to lock said cam element to said bolt to permit rotation in one direction and prevent rotation in an opposite direction;

said releasable locking means including a ratchet carried by said bolt, and a spring urged locking element supported in said cam element, a compression spring urging said locking element into engagement with said ratchet, said locking element including first and second dissimilar configurated teeth, one of said teeth having an included angle less than the other of said teeth, one of said first and second teeth being complementary with the teeth of said ratchet, whereby to enable said cam element to be rotated in one direction but prevented from rotation in a direction opposite to said one direction.

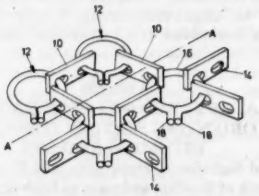


4,106,542

TIRE PROTECTIVE CHAINS

Hans Otto Dohmeier, Victoria, South Africa, assignor to Dome Inventions (Proprietary) Limited, Johannesburg, South Africa

Continuation-in-part of Ser. No. 603,807, Aug. 12, 1975, abandoned. This application Feb. 4, 1977, Ser. No. 765,855
Claims priority, application South Africa, Aug. 21, 1974, 74/5368; Oct. 31, 1974, 74/7007; Feb. 6, 1976, 76/0913
Int. Cl.[2] B60C *27/20*
U.S. Cl. 152—239 **9 Claims**



1. In a tire protective chain comprising an open network of tread links of a carbon steel forming a pattern of closed figures and arranged to be perpendicular to the surface of a tire and connectors interconnecting the tread links at the corners of the closed figures and arranged to be parallel to the surface of a tire, the connectors being loops that are threaded through perforations in the tread links and that are welded closed after being engaged with the tread links, the improvement that the tread links and connectors are of carbon steels that are different and which have been heat treated to be hardened throughout their thicknesses; that each connector is a loop having ends which lap each other and which are welded together; and that the tread links have a surface hardness of 46 to 60 Rockwell C-scale and the connectors a core hardness of 15 to 35 Rockwell C-scale.

4,106,543

STRUCTURE OF SEALING AIR VALVES FOR SPLIT RIM TYPE WHEELS

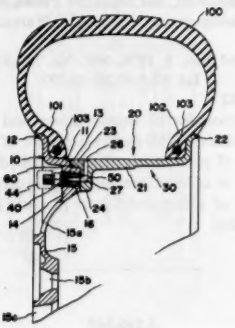
Shoichi Sano, Tokorozawa, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 23, 1976, Ser. No. 725,953

Claims priority, application Japan, Oct. 4, 1975, 50-135261[U]

Int. Cl.[2] B60C *23/00, 29/00*

U.S. Cl. 152—405 6 Claims



1. A structure for sealing air valves for split rim type wheels, comprising:

an outer split rim member having a hole passing therethrough to and through a first end surface of said outer split rim member;

a screw thread being provided in at least a portion of the surface of said outer split rim member defining said hole;

an inner split rim member having a passage therethrough extending from the periphery of said inner split rim member to a second end surface of said inner split rim member which abuts against said first end surface of said outer split rim member;

an air valve theadedly engaged in said hole, the tip of said air valve butting against said second end surface of said inner split rim member around an opening of said passage on said second end surface of said inner split rim member; and

a sealing member pre-disposed on said tip of said air valve and being pressed in sealing contact against said second end surface around said opening on said second end surface within a space defined by said second surface, the inner periphery of said fitting hole and the tip of said air valve.

4,106,544

ELECTRICALLY OPERATED FOLDING PARTITION

Guy E. Dixon, Miami, and Thomas M. Dixon, Hollywood, both of Fla., assignors to Panelfold, Inc., Miami, Fla.

Filed Sep. 20, 1977, Ser. No. 835,024

Int. Cl.[2] E05D *15/26*

U.S. Cl. 160—199 15 Claims

1. In an electrically operated folding partition comprising a plurality of rigid panels having the vertical edges thereof pivotally connected with some or all of the panels being supported from a longitudinal trackway by carriages, said panels having substantial thickness and being disposed in a flat, straight line condition when the partition is in fully closed position and being stacked in accordion folded condition when the partition is in fully open position with the hinge axes of the pivotal connection between adjacent panels being disposed at or near opposite surfaces of the partition when the partition is fully closed, that improvement comprising control means for opening and closing the partition by applying a closing force to the partition for initially extending the partition to a length greater than the over-all length thereof when fully closed, thereby moving the hinge axes toward the longitudinal center line of the partition and reversing the direction of force to an opening force applied to the partition as the hinge axes cross over the center line due to inertia of the panels with continued opening force exerted on the partition moving the panels to their fully open or closed position.

4,106,545

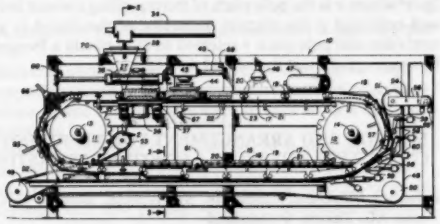
METHOD OF AUTOMATIC MOLD AND CORE FORMING

William R. Kloster, Muscatine, Iowa, and Patrick H. Stewart, Danville, Ill., assignors to C L Industries Inc., Danville, Ill.

Division of Ser. No. 688,698, May 21, 1976, Pat. No. 4,037,645, which is a continuation of Ser. No. 529,902, Dec. 5, 1974, abandoned, which is a continuation-in-part of Ser. No. 445,485, Feb. 25, 1974, abandoned. This application Apr. 20, 1977, Ser. No. 789,090

Int. Cl.[2] B22C *15/28*

U.S. Cl. 164—18 10 Claims



1. A method of making sand molds, cores or the like for use in casting foundry pieces, utilizing a first continuous conveyor having a plurality of pattern pieces and flasks attached thereto, each of the flasks being movable from an upright position through an inverted position and back to an upright position, and a second conveyor for transporting the sand molds, cores or the like from said flasks after deposition of said molds, cores or the like on said second conveyor while said flasks are in their inverted position, said method comprising the steps of substantially continuously

filling each of said flasks in turn with sand and binder mixture when each flask is in an upright position,

compacting said sand-binder mixture in each of said flasks,

allowing at least partial curing of the binder of said sand-binder mixture so that the sand-binder mixture in said flask will remain intact as a sand mold, core, or the like when inverted and separated from said flask,

inverting each of said flasks in turn, and bringing said sand mold, core or the like in each of said flasks in turn into abutting engagement with said second conveyor,

effecting release of said sand mold, core or the like from each of said flasks in turn while said flasks are in said inverted position, and

bringing said flasks back into an upright position for receipt of further sand-binder mixture therein for formation of additional sand molds, cores or the like.

4,106,546

METHOD FOR INDUCTIVELY STIRRING MOLTEN STEEL IN A CONTINUOUSLY CAST STEEL STRAND

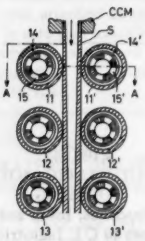
Yngve Sundberg, Vesteras, Sweden, assignor to ASEA Aktiebolag, Vesteras, Sweden

Continuation-in-part of Ser. No. 705,164, Jul. 14, 1976, abandoned, which is a continuation of Ser. No. 552,937, Feb. 25, 1975, abandoned. This application Dec. 21, 1976, Ser. No. 752,850

Claims priority, application Sweden, Feb. 27, 1974, 7402575

Int. Cl.² B22D *27/02, 11/128*

U.S. Cl. 164—49 **1 Claim**



1. A method for inductively stirring molten steel contained in a solidifed steel skin of a travelling continuously cast steel strand by means of inductive stirrer coils supplied with multiphase a-c and which are positioned tranversely adjacent to the travelling strand, said method comprising powering said coils with multiphase a-c having a frequency between ρ/τ^2 and $2\rho/\tau^2$ where τ is the pole pitch of the travelling current field in said coils and ρ the electric resistivity of the strand in ohm mm^2/mm said pole pitch τ selected so as to obtain a frequency between approximately 2.4 and 4.8 Hz.

4,106,547

METHOD AND ARRANGEMENT FOR REMOVING A COOLED STRAND FROM A CONTINUOUS CASTING INSTALLATION

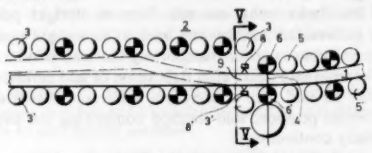
Friedrich Flückiger, Einsiedeln, Switzerland, assignor to Concast AG, Zurich, Switzerland

Filed Apr. 25, 1977, Ser. No. 790,179

Claims priority, application Switzerland, Apr. 27, 1977, 5247/77

Int. Cl.² B22D *11/00*

U.S. Cl. 164—82 **18 Claims**



1. A method of removing a cooled off stationary arcuate cast strand moving in a predetermined casting direction from a continuous casting installation, which installation includes a withdrawal and straightening zone having a pressure-exerting upper surface for bending said strand, comprising the steps of:

(a) raising said upper surface so as to permit advancement of said cooled off strand in the casting direction;

(b) advancing said cooled off strand in the casting direction;

(c) heating said cooled off strand to a temperature sufficient to enable said strand to be bent by said upper surface, said heating being carried out at a selected location such as to permit at least partial straightening of said strand via said upper surface; and

(d) bending said strand at said location while the latter is at said temperature by lowering said upper surface and thereby exerting pressure on said strand.

4,106,548

MASS FOR PRODUCTION OF CORES AND CASTING MOULDS

Pawel Murza-Mucha, Warsaw; Zbigniew Koszarewski, Raszyn; Wojciech Ostaszewski, and Stanislaw Peksa, both of Warsaw, all of Poland, assignors to Politechnika Warszawska, Warsaw, Poland

Filed Nov. 3, 1976, Ser. No. 739,533

Int. Cl.² B22D *29/00*

U.S. Cl. 164—132 **13 Claims**

1. A composition for producing cores and casting molds consisting essentially of 100 parts by weight of sand, 0.5 to 30 parts by weight of at least one alkali metal hydroxide, 1 to 40 parts by weight of at least one alkali metal carbonate, 1 to 15 parts by weight of water and 0.2 to 10 parts by weight of a hydrophilic binder.

4,106,549

ARRANGEMENT FOR TRANSPORTING AWAY STRAND PIECES

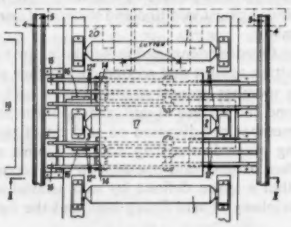
Werner Scheurecker, Linz, Austria, assignor to Vereinigte Osterreichische Eisen-und Stahlwerke - Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Jan. 7, 1977, Ser. No. 757,520

Claims priority, application Austria, Jan. 16, 1976, 267/76

Int. Cl.² B22D *11/12*

U.S. Cl. 164—263 **6 Claims**



1. In an arrangement for transporting away strand pieces, in particular crop ends, cut off in a continuous casting plant of the type including a base, a cutting means, a conveying path comprising a plurality of conveying rollers located after the cutting means in the travel direction of the strand pieces, a cut strand discharge means, and an inclined sliding path extending transversely to the conveying path, the improvement comprising:

a plurality of arms for the cut strand discharge means, said arms being pivotable over at least part of their longitudinal extension from a horizontal position downward into a tilted position; and

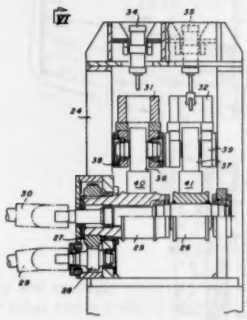
a lifting table vertically displaceable perpendicular to the conveying path and located below the arms of the cut strand discharge means so as to partially support them, at least one of the conveying rollers being arranged on the lifting table, the cut strand discharge means and the lifting table being arranged relative to one another so that lowering of the lifting table causes the arms of the cut strand discharge means, over at least part of their longitudinal extension, to pivot downward into the tilted position due to the weight of a cut off strand piece so as to provide the inclined sliding path for the strand piece.

4,106,550

PINCH ROLL STAND FOR USE IN MULTI-STRAND CONTINUOUS CASTING MACHINE

Yutaka Tsuchida, Yokosuka, Japan, assignor to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Ote, Japan

Filed Jan. 24, 1977, Ser. No. 762,134
Claims priority, application Japan, Jan. 27, 1976, 51-7602
Int. Cl.[2] B22D *11/12*
U.S. Cl. 164—448 5 Claims



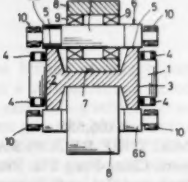
1. A pinch roll stand for use in a multi-strand continuous casting machine, comprising a plurity of pinch-roll assemblies supported in said stand, each assembly comprising a first hollow pinch roll and a second pinch roll having a bearing neck rotatably extending through said hollow pinch roll coaxially thereof, and means for driving said first and second pinch rolls in each assembly individually and independently of each other.

4,106,551

ROLLER ASSEMBLY IN THE GUIDE PATH OF A CONTINUOUS CASTING MACHINE FOR BEAM BLANKS

Yuuji Inoue, Amagasaki, Japan, assignor to Concast AG, Zurich, Switzerland

Filed May 13, 1977, Ser. No. 796,530
Claims priority, application Japan, May 18, 1976, 51-63587[U]
Int. Cl.[2] B22D *11/12;* B21B *13/10*
U.S. Cl. 164—448 7 Claims



1. A roller assembly for use in the guide path of a continuous casting machine for casting sections, especially beam blanks having a web portion and to each side thereof an outer flange having an outer flange face and flange tips, comprising:

first roller means for rotationally abutting against the outer flange faces of the beam blank;

second roller means for rotationally abutting against each pair of flange tips at each side of the beam blank;

said first roller means and said second roller means having rotational axes which extend substantially perpendicular to one another;

third roller means for rotationally abutting against opposite sides of the web portion of the beam blank;

the rotational axes of said third roller means extending substantially coaxially with respect to the corresponding rotational axes of said second roller means; and

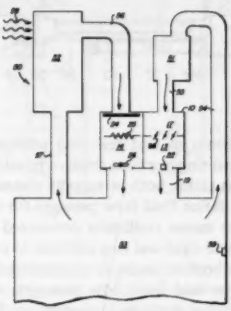
means for mounting the coaxial second roller means and third roller means on at least one side of the beam blank to rotate relative to one another.

4,106,552

METHOD OF AIR-CONDITIONING EMPLOYING VARIABLE TERMINAL BOX

Jerrold L. Hufford, Phoenix, Ariz., assignor to Armer Construction Company, Phoenix, Ariz.

Division of Ser. No. 641,755, Dec. 17, 1975, Pat. No. 4,008,756.
This application Jan. 17, 1977, Ser. No. 759,862
Int. Cl.[2] F25B *29/00;* F24J *3/02;* F28F *27/02*
U.S. Cl. 165—2 4 Claims



1. A method of air conditioning an enclosure comprising the steps of:

circulating cool air from a source of cool air through a variable volume terminal, into an enclosure to be air conditioned and back to the source of cool air in a first passageway,

circulating heated air from a source of heated air through said terminal into the enclosure when a damping means in said terminal is actuated to reduce the flow of cool air through said first passageway a predetermined amount, and

periodically additionally heating said heated air from said source of heated air when the temperature of the air from said source of heated air fails to reach the temperature called for by a thermostat in the enclosure,

the circulating of heated air through said second passageway is controlled by the pneumatic pressure in said first passageway.

4,106,553

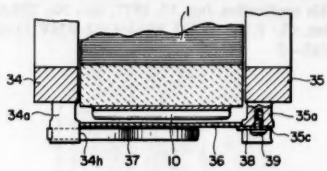
SEALING DEVICE FOR A ROTARY REGENERATIVE HEAT EXCHANGER

Kenya Nakamura, Okazaki, and Hiroshi Okano, Susono, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Aug. 17, 1976, Ser. No. 715,249
Claims priority, application Japan, Apr. 26, 1976, 51-46661
Int. Cl.[2] F28D *19/00*
U.S. Cl. 165—9 9 Claims

1. A sealing device for a rotary type regenerative heat exchanger comprising a rotary regenerative body having a pair of opposed generally planar parallel side surfaces, a pair of flat, rigid seal ring portions each positioned to extend through 360°, respectively, over said opposed surfaces on opposite sides of said rotary regenerative body, with a predetermined minute clearance spacing being maintained between each of said seal ring portions and the respective side surfaces of said regenerating body, at least a pair of cross bar portions provided one for each of said seal ring portions and extending crosswise over

said opposed side surfaces of said regenerative body from one position on a peripheral edge portion of each of said seal ring portions to another symmetrically opposite position on the same peripheral edge portion of said seal ring portion, with a predetermined minute clearance spacing being maintained between each cross bar portion and the respective side surface of said regenerative body, spacer means for maintaining clearances between said side surfaces of said rotary regenerative body and said respective seal ring portions to a predetermined value, said spacer means including spring means extending about said rotary regenerative body between respective peripheral edge portions of said seal ring portions to provide support for said seal ring portions relative to said regenerative body, cover means acting both as support means for said heat exchanger and to define fluid flow passages for said regenerative body, bellows means resiliently connected between said cover means and said rigid seal ring portions to cooperate with said cover means both to assist in supporting said seal ring portions and define said fluid flow passages, and resiliency means on said cross bar portions for imparting thereto flexibility in order to accommodate possible deformations in the central portions of said regenerative body due to thermal effects.

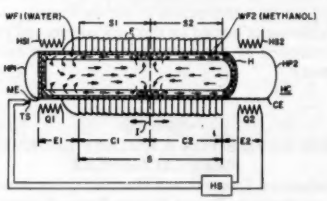


4,106,554

HEAT PIPE HEAT AMPLIFIER

Frank G. Arcella, Bethel Park, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 25, 1977, Ser. No. 818,779
Int. Cl.² F28D *15/00*
U.S. Cl. 165—32 **8 Claims**



1. A heat pipe amplifier apparatus, comprising,

a heat pipe combination means including a first and second heat pipe means each having an evaporator section and a condenser section, said first and second heat pipe means being coupled such that said condenser sections combine to form a common condenser section,

heat sink means operatively coupled to said common condenser section, and

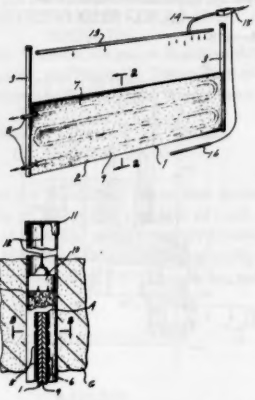
a first working fluid operatively associated with said first heat pipe means and a second working fluid associated with said second heat pipe means, said first and second working fluids being in contact in said common condenser section, the vapor pressures of the respective working fluids being different at a common temperature.

4,106,555

GROUND HEAT EXCHANGER

Yvan Quintal, 12,663 Fortin St., Montreal North, Canada

Filed Oct. 21, 1976, Ser. No. 734,738
Int. Cl.² F28D *15/00*
U.S. Cl. 165—45 **7 Claims**



1. A ground heat exchanger operatively comprising a plate of heat-conducting material having a pair of opposite lateral edges and carrying a fluid circulating coil arranged in heat-conducting relation therewith, a pair of tubes each having a longitudinal slit extending through the wall thereof, and each having one of said opposite lateral edges of the plate slidably engaged therein, the walls of said tubes providing apertures communicating the interior of said tubes with the opposite outer surfaces of the plate, and a flowable heat-conducting material operatively contained in said tubes and outwardly flowable under pressure through said apertures against the opposite outer surfaces of said plate and filling spaces and gaps eventually occurring between said plate and the surrounding ground.

4,106,556

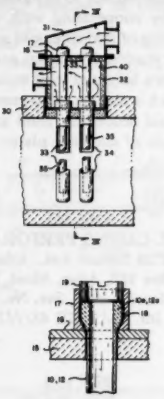
CERAMIC TUBE RECUPERATORS

Fred M. Heyn, Export; Ching-Feng Yin, Pittsburgh; Gordon L. Hanson, Bethel Park, and Robert C. Schreck, Monroeville, all of Pa., assignors to Thermal Transfer, Division of Kleinewefers, Monroeville, Pa.

Filed Nov. 26, 1976, Ser. No. 745,297
Int. Cl.² F28F *9/10*
U.S. Cl. 165—81 **5 Claims**

1. A recuperator having a chamber traversed by combustion gases, the improvement comprising a plurality of outer ceramic outer tubes in contact with said combustion gases, said tubes being closed at their bottom ends and open to a first manifold at their top, a like plurality of inner ceramic tubes extending coaxially within the outer tubes and forming an annulus therebetween and open at the bottom ends spaced from the end of the outer tube, the upper end of said inner tubes open to a second manifold, whereby gases to be heated pass through said second manifold, through the inner tube,

through the annulus between the inner and outer tubes and out through the first manifold, suspension means in each manifold



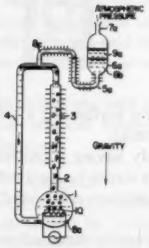
removably and sealingly receiving and supporting said inner and outer tubes respectively in each said manifold.

4,106,557

OPEN-TYPE BOILING COOLING APPARATUS

Hisao Sonobe, Ibaraki; Sadayuki Okada, Katsuta; Etsuo Oe, Hitachi; Hideo Tsukioka, Mito, and Moriichi Sato, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Sep. 8, 1976, Ser. No. 721,409
Claims priority, application Japan, Sep. 20, 1975, 50-114002
Int. Cl.² F28D *15/00*
U.S. Cl. 165—105 **32 Claims**



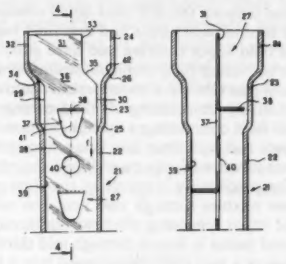
1. An open-type boiling cooling apparatus comprising: a boiling refrigerant, a cooling vessel including an evaporator section containing said boiling refrigerant and adapted to transfer the heat of a heat generating member to the refrigerant, and a condenser section completely filled with the refrigerant in a liquid state when one of no cooling or slight cooling of the heat generating member is effected, said condenser section during a cooling of the heat generating member accommodating the refrigerant in a gaseous state by displacing an amount of liquid refrigerant therefrom and liquefying the gaseous refrigerant contained therein; said condenser section becoming larger and accommodating a greater volume of gaseous refrigerant in proportion to a quantity of heat generated by the heat generating member, a liquid refrigerant reservoir means open at an upper end thereof and being adapted to store a volume of the liquid refrigerant which does not directly take part in a cooling operation of the heat generating member when a cooling operation is performed; and a communication means for communicating said condenser section with said liquid refrigerant reservoir means such that the amount of liquid refrigerant displaced by the gaseous refrigerant in the condenser section is accommodated in the liquid reservoir means during a cooling operation with the liquid refrigerant being returned to the condenser section when the cooling operation is terminated.

4,106,558

DEFLECTOR FOR HEAT EXCHANGER TUBE, ITS MANUFACTURING METHOD AND EXCHANGER COMPRISING SUCH DEFLECTORS

René Elie Neveux, Les Clayes-sous-Bois, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Filed Jun. 28, 1976, Ser. No. 700,485
Claims priority, application France, Aug. 6, 1975, 75 24538
Int. Cl.² F28F *1/40, 13/12, 9/24*
U.S. Cl. 165—109 **5 Claims**



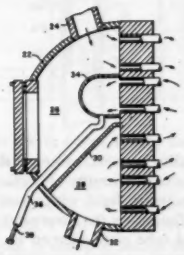
5. A heat exchanger having manifolds, water headers, liquid circulation tubes extending between said manifolds, and deflectors within said tubes, said deflectors each comprising a band (strip) of constant width substantially equal to the inner diameter of the tube and one end of which has the same width and is coplanar to at least the part of the body of the band (strip) which is in the vicinity of said end, the lateral edges of said end being oblique relatively to the lateral edges of said body, in such a manner as to oppose escaping from the tube by abutment when the deflector is swept by the circulating liquid.

4,106,559

TUBE SIDE FLOW CONTROL DEVICE FOR MOISTURE SEPARATOR REHEATERS

Paul D. Ritland, Upper Darby Township, Delaware County, and Thomas J. Rabas, Broomall, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 29, 1976, Ser. No. 755,385
Int. Cl.² F28B *9/02, 9/08, 11/00*; F28F *9/02*
U.S. Cl. 165—111 **8 Claims**



1. A heat exchanger for transferring heat from a first fluid to a second fluid with the first fluid changing phase from a vapor to a liquid, said heat exchanger comprising:

a shell;

a tube sheet having a plurality of holes therethrough;

a plurality of tubes arranged in said shell so as to be expos-

able to said second fluid, said tubes having at least one end thereof disposed in said tube sheet holes;

a chamber cooperatively associated with said shell and tube sheet;

a dividing means for separating said chamber into an inlet and an outlet portion;

an inlet opening in said chamber for providing fluid communication for said first fluid to said inlet portion;

a manifold being disposed in said chamber so as to be in fluid communication with a plurality of said tubes causing a portion of said first fluid vapor to make four passes through said tubes;

an outlet opening in said chamber for providing fluid communication for said first fluid from said outlet portion, said outlet opening being disposed in said chamber between said second and third passes where a plenum is disposed which can separate the first fluid liquid condensed in said first and second passes from said first fluid vapor prior to said first fluid vapor entering said third pass;

a vent line providing fluid communication from the exit of said fourth pass tubes to a lower pressure source, said vent line exclusively transmitting all fluid exiting said fourth pass, said fluid constituting a two phase mixture of vapor and liquid; and said vent line being disposed to vent a two-phase mixture of vapor and liquid therethrough; and

a means for predictably controlling the flow rate of said two-phase mixture through said vent line whereby said first fluid vapor remaining after passing through said first and second passes is drawn through said third and fourth passes where a part of it is condensed into a liquid.

4,106,560

FALLING-FILM HEAT EXCHANGER

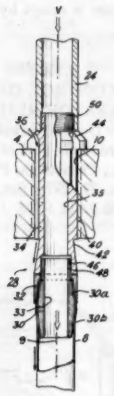
Fernand Lauro, Grenoble, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed May 17, 1977, Ser. No. 797,826

Claims priority, application France, May 26, 1976, 76 16047

Int. Cl.[2] F28B *9/00;* **F28D** *7/00;* **F28F** *9/02;* **F17C** *7/02*

U.S. Cl. 165—159 **7 Claims**



1. A thin falling-film heat exchanger of the type comprising within a fluid-tight shell a plurality of vertical flexible tubes for the circulation of primary fluid within said tubes and for the flow of secondary fluid over the external wall of said tubes, at least one horizontal tube plate pierced by holes and primary fluid distribution means, an admission chamber for said secondary fluid being defined in the upper portion of said shell by said tube plate and traversed by said primary fluid distribution means, wherein the upper end of each tube aforesaid is fixed on a unit which is of revolution with respect to the axis of the tube so as to be applied against said tube plate and connected to primary fluid distribution means, said unit being provided with an internal passage for said primary fluid and constituted by a sliding annular ring and by two so-called first and second members, said first member being provided externally with at least one frusto-conical surface so designed as to ensure attachment of said tube by cooperating with the internal wall of complementary surface of said ring, said second member being such as to have a cylindrical external surface provided with grooves extending to a height at least equal to the thickness of said tube plate in such a manner as to ensure that passages for the downflow of said secondary fluid are defined with the internal wall of a hole of said tube plate.

4,106,561

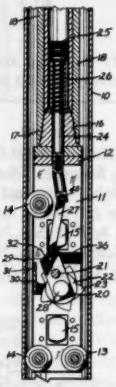
WELL CASING PERFORATOR

Robert J. Jerome, 3726 Mount Ave., Arlee, Mont. 59801, and Art Baum, P.O. Box 155, Arlee, Mont. 59821

Filed May 12, 1977, Ser. No. 796,226

Int. Cl.[2] E21B *43/112*

U.S. Cl. 166—55.2 **7 Claims**



5. An apparatus for perforating a well casing located within a bore hole, comprising:

an elongated body having a central longitudinal axis, said body being of a size to be received within the well casing;

guide means mounted on said body for engagement with the well casing;

carrier means pivotably mounted on said body about a first fixed axis perpendicular to said central longitudinal axis;

wheel means having a plurality of peripheral outwardly extending teeth;

means rotatably mounting said wheel means on said carrier means about a second axis parallel to said first axis and spaced to one side thereof;

movable piston means slidably mounted on said body, for motion parallel to said central longitudinal axis;

means for selectively moving said piston means in one direction;

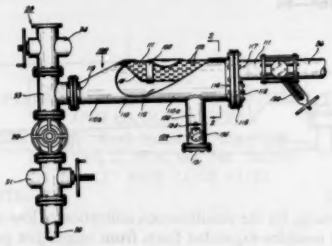
link means pivotally interconnecting said movable piston means and said carrier means about axes respectively parallel to said first axis for imparting pivotal movement to said carrier means about said first axis in response to movement of said piston means relative to said body in said one direction, whereby the carrier is moved between a first position having said teeth spaced inwardly from the well casing to a second position having said teeth in friction engagement with the well casing;

and means for moving said body relative to the well casing in said one direction for moving said carrier means from said second position to a third position, causing the teeth to perforate the well casing.

4,106,562
WELLHEAD APPARATUS

Michael L. Barnes, Sebastopol, and Olin D. Whitescarver, Santa Rosa, both of Calif., assignors to Union Oil Company of California, Brea, Calif.

Filed May 16, 1977, Ser. No. 797,176
Int. Cl.[2] E21B *43/00*
U.S. Cl. 166—97 12 Claims



1. A debris separating device for separating and accumulating debris flowing with fluids produced from a well, which comprises:

a first conduit defining an accumulation chamber having a substantially horizontal axis;

adaptor means to provide fluid tight communication between said first conduit and said well and defining an inlet for receiving the fluids and debris from said well, said inlet having a smaller cross-sectional area than said first conduit;

closure means for sealing the outlet end of said first conduit and defining an outlet aperture of a smaller cross-sectional area than said first conduit;

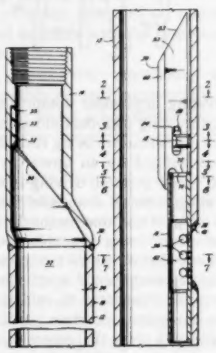
a second conduit extending through said outlet aperture and into said chamber, said second conduit including a perforated section disposed within said chamber to provide fluid communication between said second conduit and said chamber and to prevent passage therebetween of said debris; and

access means communicating into said accumulation chamber to facilitate the periodic removal of accumulated debris from said chamber.

4,106,563
SIDEPOCKET MANDREL

Alvin O. Gatlin, Houston; Gilbert H. Tausch, Sugar Land, and Fred E. Watkins, Houston, all of Tex., assignors to Camco, Incorporated, Houston, Tex.

Filed Nov. 3, 1977, Ser. No. 848,008
Int. Cl.[2] E21B *23/02*
U.S. Cl. 166—117.5 8 Claims



1. A mandrel for use in a well tubing comprising,

a body having an open bore extending therethrough for alignment with the well tubing and having an offset bore adjacent the open bore, said body having an opening in communication with the offset bore,

a valve pocket positioned inside the body in the offset bore and beside the body opening for receiving flow control devices,

a deflector guide positioned in the offset bore above the pocket and having a pair of rails forming a guide path between for allowing the entrance of flow control devices into said pocket but preventing the entrance of open bore tools into the guide path,

the top of the deflector guide extending upwardly and outwardly from the open bore for providing a deflecting surface which prevents open bore tools from catching on the guide or on any device in the pocket,

said deflector guide and said pocket being telescopically secured together for insuring alignment therebetween,

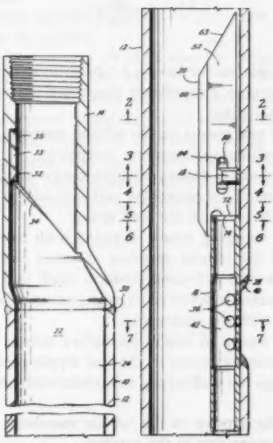
a locking lug secured to the deflector guide above said pocket, said lug being of a material having a greater resistance to corrosion than said deflector guide,

an intergrally forged sub welded to the top of the body, said forged sub including an actuating shoulder angularly spaced from the axis of the offset pocket a predetermined amount, and a guide surface positioned below said shoulder and directed upwardly towards said shoulder.

4,106,564
SIDEPOCKET MANDREL

Gilbert H. Tausch, Sugar Land, Tex., assignor to Camco, Incorporated, Houston, Tex.

Filed Nov. 3, 1977, Ser. No. 848,053
Int. Cl.[2] E21B *23/00*
U.S. Cl. 166—117.5 3 Claims



1. A mandrel for use in a well tubing having a body having an open bore extending therethrough for alignment with the well tubing and having an offset bore adjacent the open bore, said body having an opening in communication with the offset bore, said body having a top and bottom adapted to be connected to well tubing, orientation means in the top in the open bore, a valve pocket positioned inside the body in the offset bore and besides the body opening for receiving flow control devices, a deflector guide positioned in the offset bore above the pocket and having a pair of rails forming a guide path therebetween for allowing the entrance of flow control devices into said pocket but preventing the entrance of open bore tools into the guide path, the top of the deflector guide extending upwardly and outwardly from the open bore for providing a deflecting surface which prevents open bore tools from

catching on the guide or on any device in the pocket, and a locking lug secured to the deflector guide above said pocket, the improvement comprising

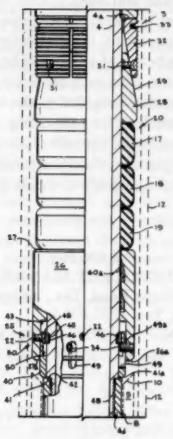
said deflector guide and said pocket being telescopically secured together for insuring alignment therebetween.

4,106,565

SEAL NIPPLE PACKER

Britt O. Braddick, Houston, Tex., assignor to Texas Iron Works, Inc., Houston, Tex.

Filed Apr. 15, 1977, Ser. No. 787,856
Int. Cl.² E21B *23/00*
U.S. Cl. 166—118 **4 Claims**



1. In a seal nipple packer having a tubular member with seals thereon for sealing in a receptacle supported in a well string, the invention including:

a. expandable seal means on the tubular member for sealing with the well string above the receptacle;

b. actuating means including a setting sleeve movable on the tubular mandrel for expanding said expandable seal means into engagement with the well string;

c. releasable retaining means engaged with said actuating means and the tubular member to retain said actuating means in a non activated position until said releasable retaining means is actuated by engagement of said actuating means with the receptacle;

d. additional means to inhibit premature release of said releasable retaining means as the seal nipple packer is lowered through the well string, said additional means including:

1. an annular groove on the tubular member;

2. a split keeper ring in the groove;

3. a releasing sleeve which at one end thereof abuts a shoulder on the tubular member, said releasing sleeve being telescopically received within said setting sleeve and having a portion overlapping and abutting said keeper ring to retain it in the groove in the tubular member;

4. projection means secured with said setting sleeve and abutting said releasing sleeve and keeper ring; and

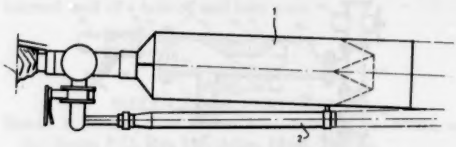
5. said releasable retaining means securing said setting sleeve and said releasing sleeve together to retain said projection means in abutting relationship with said releasing sleeve and keeper ring and to retain said releasing sleeve in abutting relationship over said keeper ring.

4,106,566

PROCESS FOR THE UTILIZATION OF LOW AND MEDIUM EXPANDED FOAM FOR THE EXTINCTION OF FIRES FROM LIQUEFIED PRODUCTS

Guy Dion-Biro, Vincennes, France, assignor to Biro Fils, Paris, France

Filed Aug. 2, 1976, Ser. No. 711,085
Int. Cl.² A62C *1/12, 31/12*
U.S. Cl. 169—44 **2 Claims**



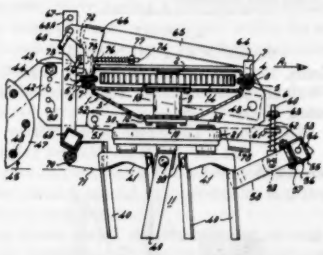
1. A process for the simultaneous utilization of low expanded foam and medium expanded foam from respective generators thereof for the extinction of fires from liquefied gas and other burnable substances, said low expanded and medium expanded foams being relatively faster and slower traveling, said process comprising directing a plurality of jets of low expanded foam in a circular arrangement beneath a jet of medium expanded foam such that the jets of low expanded foam and the jet of medium expanded foam are inclined at angles between 8° and 12°, transporting the medium expanded foam by the faster traveling low expanded foam in order to provide a high velocity of flow and a greater range of the medium expanded foam, the jets of low expanded foam being set back from the jet of medium expanded foam for slicing off a lower portion of the jet of medium expanded foam.

4,106,567

SOIL CULTIVATING IMPLEMENTS

Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Filed Sep. 16, 1976, Ser. No. 723,726
Claims priority, application Netherlands, Sep. 19, 1975, 7511052
Int. Cl.² A01B *33/06*
U.S. Cl. 172—59 **11 Claims**



1. A soil cultivating implement comprising a frame and a plurality of soil cultivating members mounted on a portion of said frame, each of said members being rotatable about a corresponding first axis defined by an upwardly extending shaft supported on said frame portion, driving means connected to rotate said cultivating member about said first axis, said member comprising a support and tine means depending from said support, said tine means being rotatable about a second upwardly extending axis that is rotated around said first axis, said tine means comprising two spaced apart tines having respective fastening portions connected to said support, said tines having respective elongated operative portions which extend substantially parallel to a plane that passes through said second axis and said plane being normal to a line passing between the fastening portions of the tines, said operative portions being

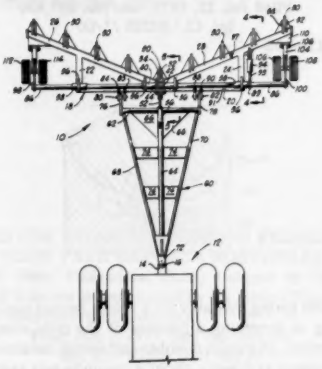
inclined to a further plane that passes through said line and the second axis.

4,106,568

CHISEL PLOW WITH ADJUSTABLE TOWING TONGUE AND GAUGE WHEELS

Ted L. Cline, Box 37, Rush Springs, Okla. 73082

Filed Dec. 2, 1976, Ser. No. 746,697
Int. Cl.² A01B *13/08, 63/22*
U.S. Cl. 172—327 12 Claims



12. In a chisel plow including a framework having a pair of blade-supporting frame bars angled to each other in a horizontal plane to define a V in configuration, and further having chisel blades mounted on said frame bars and projecting downwardly therefrom, the improvement which comprises:

a transversely extending frame bar at the forward side of said framework;

a towing tongue pivotally connected to the forward side of the framework for pivotation about a horizontal axis;

means for pivoting the tongue and framework relative to each other between a first position in which the framework is in coplanar alignment with the towing tongue, and other positions in which the framework is angulated with respect to the towing tongue;

gauge wheels pivotally mounted on opposite ends of said frame bar and movable with the framework in relation to the towing tongue;

an elongated, transversely extending control member mounted rotatably on said transversely extending frame bar for rotation about a horizontal axis extending transversely across the direction of travel of the plow when plowing;

crank means connected between said transversely extending control member and said gauge wheels for pivoting the gauge wheels on the framework when said transversely extending control member is rotated; and

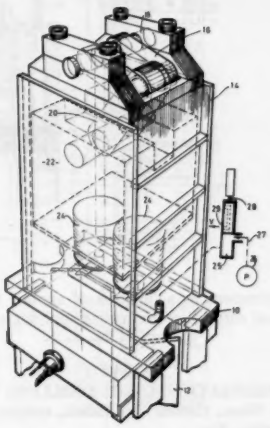
means for rotating said transversely extending control member independently of the angulation adjustment of said framework with respect to said towing tongue, whereby said gauge wheels may be independently adjusted with respect to said towing tongue to facilitate independent control of blade depth and blade earth penetration angle.

4,106,569

APPARATUS FOR APPLYING AN IMPACT FORCE

Harry Edgworth, 35a Broad Oaks Rd., Solihull, West Midlands, England, and Frederick Edgworth, Solihull, England, assignors to Harry Edgworth, England

Filed Feb. 6, 1976, Ser. No. 655,906
Claims priority, application United Kingdom, Feb. 14, 1975, 6248/75
Int. Cl.² E02D *7/18*
U.S. Cl. 173—1 14 Claims



1. An apparatus for applying a high force to an object, such apparatus comprising:

a. a frame,

b. a driving member mounted on the frame and adapted to engage the object,

c. a weight mounted on the frame for reciprocating movement relative thereto, and

d. means for causing the weight to perform said reciprocating movement including means to cause sudden retardation of the weight at one stage during each complete reciprocation, the high force arising from the sudden retardation being transmitted from the weight to the object without impact, as herein defined.

4,106,570

ANGLE SENSING TOOL FOR APPLYING TORQUE

Siavash Eshghy, Pittsburgh; George D. Hall, Oakmont, and Dennis R. Hammerle, Pittsburgh, all of Pa., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Feb. 7, 1977, Ser. No. 766,429
Int. Cl.² B23Q *5/027*
U.S. Cl. 173—12 15 Claims

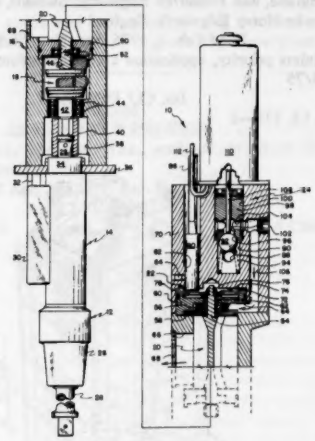
1. A tool comprising

means for applying torque to a workpiece;

means for determining rotation of the torque applying means;

means for sensing torque applied to the workpiece; and

means for compensating for torsional twist in the torque applying means including means correcting the rotational



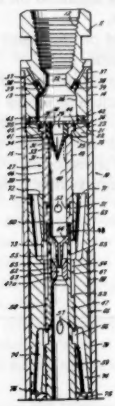
determinations as a function of applied torque and the torsional stiffness of the torque applying means.

4,106,571

PNEUMATIC IMPACT DRILLING TOOL

Charles W. Stone, Garden City, Mich., assignor to Reed Tool Co., Houston, Tex.

Filed Dec. 6, 1976, Ser. No. 747,769
Int. Cl.[2] B25D *17/14*
U.S. Cl. 173—64 **5 Claims**



1. An impact drilling tool for connection in a string of drilling pipe comprising

an upper sub for connection to said drilling pipe,

a casing with an upper end connected to said upper sub,

an anvil member slidably positioned in the lower end of said casing and having a bit member on its lower end extending outside said casing,

a hammer piston in said casing above said anvil member for reciprocal movement longitudinally of said casing to strike said anvil member repeatedly.

a feeder tube for feeding compressed pneumatic fluid from said drilling pipe extending longitudinally of said casing through said hammer,

a plurality of passages and valve openings cooperable therewith in said feeder tube and said hammer piston to apply compressed pneumatic fluid to one end of said hammer piston when in one position and to the other end when said hammer piston is in another position, for effecting reciprocal movement thereof,

said casing and said sub defining an inlet chamber for receiving compressed pneumatic fluid in the inlet to said feeder tube,

at least one passageway in said tool opening from said inlet chamber diagonally through said sub to discharge pneumatic fluid upward and outward from said tool, and

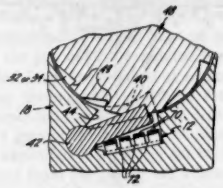
a check valve positioned inside said passageway and opening to discharge fluid outside said tool and closing to prevent flow backward through said passageway into said tool.

4,106,572

PAWL SPRING ASSEMBLY FOR A ROTARY IMPACT MECHANISM

J. Edward C. Anderson, Moreland Hills, Ohio, assignor to Marquette Metal Products Co., Cleveland, Ohio

Filed Jul. 21, 1977, Ser. No. 817,830
Int. Cl.[2] B25D *15/00*
U.S. Cl. 173—93 **6 Claims**



1. A pawl spring assembly for a rotary impact mechanism for tightening or loosening a fastener of the type comprising an input member, an output member and inertia member arranged in approximate symmetry about a common axis and journaled upon each other at mating, mutually telescoping, circular surfaces for independent angular movement about the common axis, a pawl and ratchet assembly for interconnecting the input and output members together for torque transmission, the pawl being carried by the inertia member and the ratchet connected for conjoined rotation with the output member, a power spring means interconnecting the input and inertia members for storing energy upon relative angular movement of the input and inertia members and for releasing the stored energy to accelerate angular movement of the inertia member, a cam coacting with the pawl upon relative angular movement of the input and inertia members to disengage the pawl from the ratchet and release the pawl for impact engagement with the ratchet to thereby rotatively drive the output member, the pawl spring assembly comprising:

a plurality of spring elements arranged to sequentially engage and load the pawl as the pawl is moved by the cam in a direction to disengage from the ratchet as the pawl is moved by said cam in a direction to disengage from a tooth of the teeth of the output member.

4,106,573

DRILL

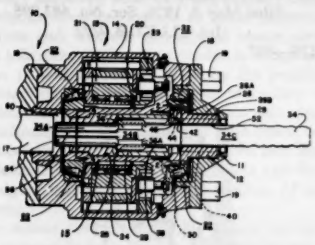
Edward A. Bailey, Newport, N.H., assignor to Joy Manufacturing Company, Pittsburgh, Pa.

Filed Sep. 13, 1976, Ser. No. 722,811
Int. Cl.[2] B25D *9/00*
U.S. Cl. 173—106 **13 Claims**

1. In an actuator adapted to receive therein a drive portion of an elongated working member and including selectively energizable drive means engageable in rotary driving engagement with said drive portion for axial rotation of said working member, the improvement comprising:

said actuator including working member retention means

rotatable with respect to said drive means to retain said drive portion in rotary driving engagement with said



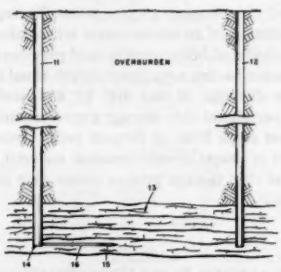
drive means during rotation of said working member in one rotary direction only.

4,106,574

METHOD FOR ESTABLISHING HIGH PERMEABILITY FLOW PATH BETWEEN BOREHOLES

Jerome P. Dow, Pleasanton, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 7, 1977, Ser. No. 813,551
Int. Cl.[2] E21B *7/00, 43/26*
U.S. Cl. 175—4.57 **6 Claims**



1. A method for establishing a high permeability flow path from a first borehole to a second borehole adjacent thereto in a subterranean formation which method comprises:

emplacing in the first borehole at a preselected depth a means for rapid penetration of terrestrial materials including an earth penetrating projectile and a means for delivering said projectile into the subterranean formation at an impact velocity sufficient for rapid penetration of subterranean materials;

orienting said means within the first borehole so as to enable rapid penetration of the subterranean formation by said earth penetrating projectile substantially along a preselected path from the first borehole to the second borehole; and

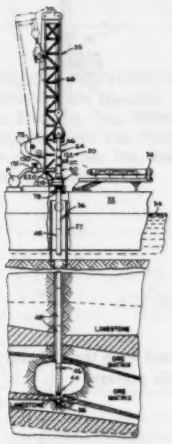
causing rapid penetration of the subterranean formation by said earth penetrating projectile, thereby establishing a high permeability flow path from the first borehole to the second borehole.

4,106,575

TOOL STRING AND MEANS FOR SUPPORTING AND ROTATING THE SAME

Philip R. Bunnelle, Santa Clara, Calif., assignor to FMC Corporation, San Jose, Calif.

Division of Ser. No. 704,277, Jul. 12, 1976, Pat. No. 4,077,481. This application Apr. 6, 1977, Ser. No. 785,142
Int. Cl.[2] E21C *45/00*
U.S. Cl. 175—170 **22 Claims**



1. In a subterranean drilling and mining apparatus operable to both drill into subterranean deposits of ore and to mine the ore as a slurry; including a multi-section tool string having means defining an inner conduit and means defining an outer conduit, and a drill bit at the lower end of the tool string; the improvement which comprises a mining head connected to the upper end of said tool string during mining, a drilling head separate and independent from said mining head during drilling and adapted to be connected to each upper section of the tool string in turn during drilling and to the upper portion of the mining head during mining, first power means connected to said drilling head for supporting said tool string for vertical movement and for rotating said drilling head and tool string during drilling, and second power means for rotating only the outer conduit of each upper section in turn when adding sections to or removing sections from the portion of the tool string therebelow, said second power means rotating both said inner and outer conduit means of said tool string along with a portion of said mining head during mining.

4,106,576

SAMPLING TUBE CLEANING DEVICE

James M. Clements, R.R. #1, Box 162A, Newton, Iowa 50208

Division of Ser. No. 670,977, Mar. 26, 1976. This application Oct. 3, 1977, Ser. No. 838,576
Int. Cl.[2] G01N *1/00*
U.S. Cl. 175—313 **6 Claims**

1. A soil sample tube cleaning device, comprising a handle portion;

a cleaning head having a shaft which is connected to the handle portion;

said cleaning head having a trough cleaner which is mounted to the shaft portion of said cleaning head so as to be at substantially a right angle to the longitudinal axis of said handle, adapted for being pulled along the length of a

soil sample holding trough of a soil sample tube, and an end core removal member arranged for removal of the

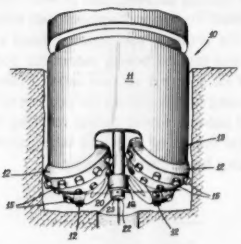
end core of soil from the end of a sample tube by pulling on said handle portion.

4,106,577

HYDROMECHANICAL DRILLING DEVICE

David A. Summers, Rolla, Mo., assignor to The Curators of the University of Missouri, Columbia, Mo.

Filed Jun. 20, 1977, Ser. No. 808,161
Int. Cl.[2] E21C *15/00*
U.S. Cl. 175—340 1 Claim



1. Rock drilling apparatus comprising:

a mechanical rock drilling tool in the form of an elongate cylindrical body having a longitudinal axis and a plurality of drilling teeth formed on rotatable cones and mounted on one end thereof;

a high pressure water jet nozzle mounted co-axially with said drilling tool body ahead of said drilling teeth and having orifices directed along said axis and at an angle with respect to said axis and adapted to drill a hole of relatively small diameter in rock in advance of a hole of relatively larger diameter formed by said drilling teeth;

said nozzle having a radial orifice for each of said rotatable cones and directed to cut rock immediately in advance of said drilling teeth; and

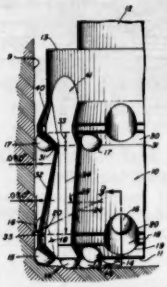
means for rotating said drilling tool about its longitudinal axis for performing its drilling function.

4,106,578

PERCUSSION DRILL BIT

Leaman Rex Beyer, Box 207, Diamond, Mo. 64840

Filed May 4, 1976, Ser. No. 683,095
Int. Cl.[2] E21B *9/22*
U.S. Cl. 175—407 3 Claims



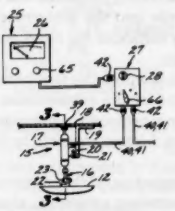
1. In a rotary percussion drill bit having a cylindrical body portion having first and second ends with a flat bottom and a bevel face on one end and a shank axially aligned with said cylindrical portion on said other end, a first set of inserts of hard wear resistant material mounted in said body portion and projecting downwardly from said flat bottom and said bevel face, said body portion having a longitudinal groove means formed in said cylindrical body portion to provide a passage for dislodged chips and a peripheral groove means for passage of dislodged chips, said peripheral groove means formed around said cylindrical body portion intermediate said first and second ends, and at least a second set of inserts of wear resistant material spaced from said first set of inserts of wear resistant material mounted in said cylindrical body portion, an improvement comprising a peripheral chip storage groove means formed at the location of said peripheral groove means said peripheral chip storage groove means having a crossectional configuration of an obtuse angle when taken along the axis of said cylindrical body portion, said peripheral chip storage groove means having a maximum depth equal to or greater than 1/12 the diameter of said drill bit and having the side walls of said peripheral chip storage groove means tapered to form an obtuse angle from its deepest point toward said first and second set of inserts of wear resistant material, and therein said peripheral chip storage groove means give more storage for drill cuttings.

4,106,579

LOAD ANALYZER FOR AUTOMOTIVE VEHICLE

Marvin F. Hayes, Sr., and Marvin F. Hayes, Jr., both of 12424 Dawn La., Cerritos, Calif. 90701

Filed Mar. 25, 1977, Ser. No. 781,351
Int. Cl.[2] G01G *19/08, 3/14*
U.S. Cl. 177—137 3 Claims



1. A load measuring system for use on an automotive vehicle in which a load bed is carried by vehicle axles in spring biased

arrangement to allow relative movement therebetween comprising:

a sensor having a pair of elements including primary and secondary induction coils with said primary connected to the vehicle electrical system to draw electrical power therefrom and wherein one of said sensor elements includes a ferromagnetic core mounted in reciprocal fashion relative to said secondary, whereby the position of said ferromagnetic core relative to said secondary varies the magnitude of said signal, and wherein said elements are longitudinally movable relative to each other, one of said elements being secured to said load bed and the other of said elements being secured to a vehicle axle for generating a signal indicative of relative position of said sensor elements;

indicator means connected to said sensor to receive said signal to provide an indication of weight in said load bed and connected to said secondary to receive an electrical signal provided therefrom;

adjustment means for altering the indication provided by said indicator means to allow recalibration of said sensor; and

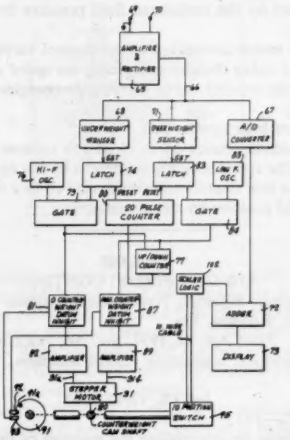
a voltage regulation circuit coupled to said vehicle electrical system and means for transforming direct current to alternating current coupled to said voltage regulation circuit and to said primary.

4,106,580

FORCE MEASURING APPARATUS

James J. DeMasters, Elmhurst, and Victor J. Musante, Garden City, both of N.Y., assignors to Brookline Instrument Company, Wallingford, Conn.

Filed Oct. 26, 1976, Ser. No. 735,146
Int. Cl.² G01G *1/32*
U.S. Cl. 177—205 **11 Claims**



1. Force measuring apparatus, comprising:

a. a balance beam (**1**);

b. means (**49,48,43,41**) for applying a force to be measured to the balance beam;

c. counterweight means (**38**) operable to apply a balancing force to the balance beam in opposition to the force to be measured;

d. means (**20, 21–29,33**) for operating the counterweight means to vary the force thereof;

e. means (**45** or **51,67,72**) responsive to the position of the beam within a predetermined control range for producing a first digital signal representative of the load indicated by that position;

f. means (**68,75,81,82**; **71,84,87,89**; and **31**) responsive to movement of the beam to a limit of that range for driving the counterweight operating means in a sense tending to restore the beam to a position within that range;

g. means (**95,102**) actuated concurrently with the counterweight operating means for producing a second digital signal representative of the increment of force due to a change in the counterweight means;

h. means (**72**) for adding said first and second digital signals; and

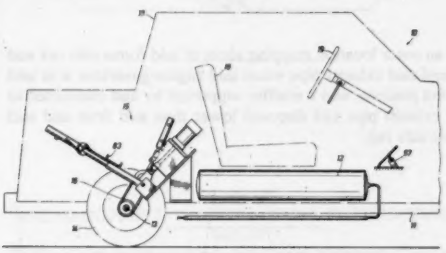
i. display means (**73**) for indicating the output of the adding means.

4,106,581

VEHICLE UTILIZING CRYOGENIC FUEL

Curtis W. West, 7227 Drowsy Pine, Houston, Tex. 77092; Larry E. Lee, 9027 Eldora, Houston, Tex. 77080, and Aubrey O. Norris, P.O. Box 264, Pinehurst, Tex. 77362

Filed Mar. 5, 1976, Ser. No. 664,110
Int. Cl.² B60K *3/02*
U.S. Cl. 180—54 B **15 Claims**



1. A vehicular power source, comprising;

an engine operable by expanding gases which imparts rotation to an output shaft;

a cryogenic liquid storage container means for receiving and storing a specified quantity of a cryogenic liquid therein;

a feed line extending from said storage means for removing cryogenic liquid therefrom, said line connecting to said engine;

means for adding heat to the cryogenic liquid removed from said container means by said line sufficient in amount to boil the cryogenic liquid and thereby create a flow of gas for pressurizing the engine to cause it to operate;

valve means for controlling the rate of flow of gas to said engine;

a vapor space above a liquid storage space in said storage means;

means for removing and vaporizing a portion of the liquid therein; and

means for returning at least a portion of the vaporized liquid to the vapor space to pressurize the liquid in said storage means to force liquid from said storage means into said feed line.

4,106,582

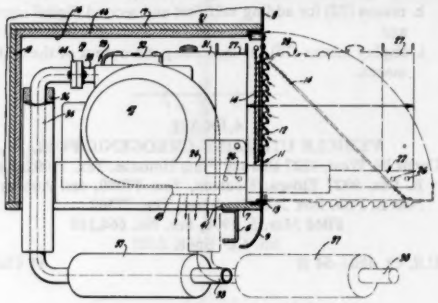
ENGINE-GENERATOR MOUNTING FOR A VEHICLE

Gasper V. De Bella, c/o Lothrop & West 1150 Alcoa Bldg., San Francisco, Calif. 94111

Filed Nov. 12, 1976, Ser. No. 741,293
Int. Cl.² D60K *13/04*
U.S. Cl. 180—64 A **3 Claims**

1. An engine-generator mounting for a vehicle having a frame side rail and a floor above and overlying said frame side rail comprising means on said floor for supporting an engine-generator for movement in a predetermined linear path between a first position above said floor and a second position at least partially extending beyond said floor, an engine-generator on said supporting means and including a rigid exhaust pipe

extending from a point above said floor to a location below said floor, means defining an elongated slot in said floor surrounding said exhaust pipe and extending in a direction parallel to said linear path between an inner location around said exhaust pipe when said engine-generator is in said first position



and an outer location stopping short of said frame side rail and around said exhaust pipe when said engine-generator is in said second position, and a muffler supported by and connected to said exhaust pipe and disposed lower than said floor and said frame side rail.

4,106,583

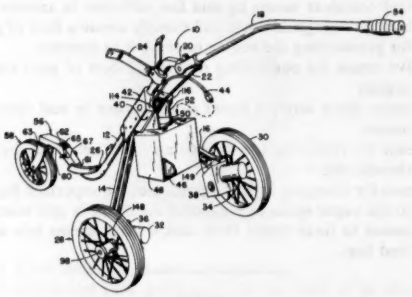
SELF-POWERED FOLDING GOLF CART

Edwin A. Nemeth, Martinez, Calif., assignor to P. N. Associates, Inc., Walnut Creek, Calif.

Filed Aug. 25, 1976, Ser. No. 717,780

Int. Cl.[2] B62D *51/04*

U.S. Cl. 180—65 E **7 Claims**



1. In a foldable golf club carrying cart including a guide arm and a pair of laterally disposed drive wheels, the improvement comprising:

a pair of d.c. drive motors each directly coupled to one of said drive wheels;

a limited slip electric differential including a power control circuit operative to receive a control signal from an electric throttle and to communicate moderated power to both said independent drive motors in a controlled pulse train for providing independent power to said drive wheels, whereby said cart is easily turned without transfer of power between said drive wheels.

4,106,584

VEHICLE SPEED CONTROL SYSTEM

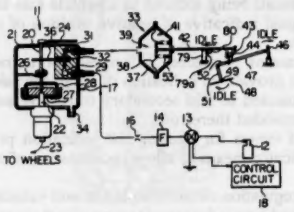
Hiroshi Matsubara, Matsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Nov. 30, 1976, Ser. No. 746,261

Claims priority, application Japan, Dec. 5, 1975, 50-164903[U]; Dec. 5, 1975, 50-164904[U]; Dec. 5, 1975, 50-164905[U]

Int. Cl.[2] B60K *31/00*

U.S. Cl. 180—105 E **13 Claims**



1. A vehicle speed control system comprising:

a fuel control member;

a fluid pressure source;

a vehicle speed sensor arranged to modulate fluid pressure from the fluid pressure source to a value corresponding to sensed vehicle speed;

an electrically actuated control valve connected between the fluid pressure source and the speed sensor;

an actuator actuated by the speed sensor to control a position of the fuel control member in such a manner as to demand a predetermined vehicle speed, the actuator being actuated by the modulated fluid pressure from the speed sensor,

operable means connected to the control valve to open the control valve thereby energizing the speed sensor and to close the control valve thereby de-energizing the speed sensor,

an exhaust brake valve; and

switch means connected to close the exhaust brake valve when the speed sensor is energized by the operable means and the fuel control member is moved to a minimum fuel demand position by the actuator.

4,106,585

AIR GUN FIRING CONTROL

Willem Huizer, Rijswijk, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Jan. 24, 1977, Ser. No. 762,216

Claims priority, application United Kingdom, Feb. 5, 1976, 4576/76

Int. Cl.[2] G01V *1/08*

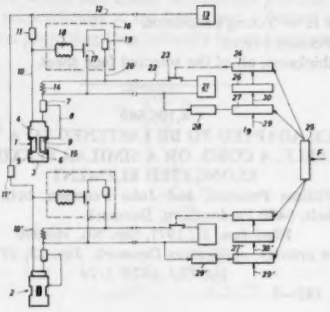
U.S. Cl. 181—107 **5 Claims**

1. Apparatus for controlling the moment of firing of an air gun, having a control chamber and a firing chamber, said air gun being fired by an electric system comprising an electric source, a two-conductor electric cable connecting the electric source with the actuating means of said air gun, electric switch means for controlling the electric connection between the electric source and the cable, and means for operating the switch means to a predetermined time period after a command signal has been supplied thereto, said apparatus comprising:

means adapted to be operatively coupled to the air gun and adapted to (influence an electrical property) change the electrical impedance across the two conductor cable of the electrical system upon detection of an increase in air pressure in the control chamber that accompanies the generation of a seismic pulse;

means for detecting a change in the value of said electrical impedance (electric property) of the electric system;

means for determining the length of the time period extending between the command signal and the said change of value of the electrical impedance (electric property); and,



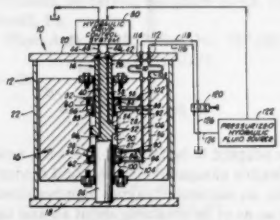
means for adjusting the length of said predetermined time period in relation to the length of the time period between the command signal and the said change of value of the electrical impedance (electric property).

4,106,586

HYDRAULIC VIBRATOR

Jay H. Stafford, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Jun. 6, 1977, Ser. No. 803,465
Int. Cl.[2] G01V *1/14, 1/04*
U.S. Cl. 181—121 **8 Claims**



1. In a hydraulic vibrator having a piston member comprised of a pair of oppositely extending rods connected to a centrally disposed drive piston and a reaction mass reciprocally disposed around the piston member forming a hydraulic drive cylinder therein so that when hydraulic fluid is introduced to the drive cylinder relative to the drive piston the reaction mass is reciprocated, the improvement comprising:

a sleeve slidably disposed on each of the rods, each of said sleeves including a cylindrical portion of reduced diameter at the inner end thereof adjacent the drive piston and a cylindrical portion of enlarged diamter at the outer end thereof forming inner and outer oppositely facing annular surfaces on said sleeve;

the reaction mass including a pair of enlarged cylindrical recesses positioned at opposite ends of the drive cylinder for containing said enlarged cylindrical portions of said sleeves, each of said recesses terminating in inner and outer annular surfaces for coacting with said inner and outer annular surfaces of said enlarged portions of said sleeves and confining the longitudinal movement of said sleeves, the longitudinal lengths of said recesses being such that when said outer annular surfaces of said enlarged portions of said sleeves are in contact with said outer annular surfaces of said recesses, the reduced diameter portions of said sleeves lie substantially outside the drive cylinder and when said inner annular surfaces of said enlarged portions of said sleeves contact said inner annular surfaces of said recesses, said reduced diameter portions of said sleeves are extended within the drive cylinder thereby reducing the displacement of the drive cylinder;

slidable seal means attached to said enlarged portions of each of said sleeves for providing seals between said enlarged portions of said sleeves and the peripheral surfaces of said recesses; and

means including ports for introducing hydraulic fluid into said recesses on selected sides of said slidable seal means connected to said recesses and to a source of pressurized hydraulic fluid whereby said sleeves can be simultaneously selectively moved between positions whereby said portions of reduced diameter thereof lie substantially outside the drive cylinder and positions whereby said portions of reduced diameter extend within the drive cylinder thereby reducing the displacement thereof.

4,106,587

SOUND-SUPPRESSING STRUCTURE WITH THERMAL RELIEF

Dudley O. Nash, Forest Park, and Joseph Holowach, Cincinnati, both of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jul. 2, 1976, Ser. No. 702,115
Int. Cl.[2] G10K *11/00*
U.S. Cl. 181—213 **12 Claims**

1. Sound-suppressing structure comprising:

a duct wall partially defining a fluid flow path and having a hollow cavity therein;

a low frequency acoustic panel within said cavity and having a first cellular core sandwiched between a pair of first facing sheets, one of said first sheets penetrated by a plurality of hollow tubes rigidly attached thereto, one end of each tube extending into a core cell and providing the only access to the interior thereof; and

a high frequency acoustic panel within said cavity and covering said low frequency panel to further define the fluid flow path, said high frequency panel having a second cellular core sandwiched between a pair of second facing sheets, one of said second sheets perforated with a pluraity of small diameter holes communicating with the interiors of the second core cells, wherein

said high frequency panel includes a plurality of apertures extending completely therethrough in general alignment with the hollow tubes and freely receiving the ends thereof; and

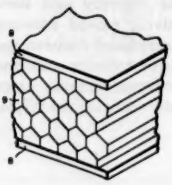
wherein said high frequency panel is slidingly connected to said duct wall by at least one slip joint to permit relative thermal growth of one of said panels without inducing stresses in the other of said panels.

4,106,588

MODE CANCELING COMPOSITE PANEL FOR GREATER THAN MASS-LAW TRANSMISSION LOSS IN THE PRINCIPAL SPEECH BANDS

James A. Moore, Cambridge, and Richard H. Lyon, Belmont, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jul. 29, 1976, Ser. No. 709,822
Int. Cl.[2] E04B *1/99*; G10K *11/04*
U.S. Cl. 181—284 **1 Claim**



1. An acoustic panel in a surrounding medium, said panel having greater than mass-law transmission loss in the principal speech band comprising

a pair of homogeneous face sheets,

a core completely filling the space between said face sheets and bonded thereto to a form a unitary composite panel,

a predetermined double wall symmetric mode resonance frequency of the panel delineates the low end of the band of frequencies having greater than mass-law transmission loss, the panel face sheets and core having the following parameters which are selected to provide this predetermined double wall symmetric mode resonance frequency as given by the equation

$$f_{dw} = \frac{1}{2\pi}\left(\frac{\frac{2E_{11}}{L}}{(\rho_{fs} + \frac{1}{6}\rho_c L)}\right)^{\frac{1}{2}}$$

where

L is the thickness of the selected core material,

ρ_{fs} is the surface mass density of a selected face sheet,

ρ_c is the density of the core material,

E_{11} is the elastic compressive stiffness of the core in the direction perpendicular to the face sheets,

the phase speed of the antisymmetric mode at the transition between the low-frequency behavior of the panel and its high-frequency behavior is given by

$$c_{ph}^2 = \left(\frac{GL}{2(\rho_{fs} + \frac{1}{2}\rho_c L)}\right)^{\frac{1}{2}}$$

where G is the shear stiffness of the core in the plane of the panel in the direction of highest shear stiffness for said core, where the core is anisotropic,

the value of c_{ph} being subsonic respect to the speed of sound, c_o, in the medium surrounding the panel,

the predetermined upper frequency limit of the band of frequencies having greater than mass-law transmission loss being delineated by:

$$f_{fs} = \frac{c_o^2}{2\pi}\left\{\frac{(\rho_{fs} + \frac{1}{6}\rho_c L)}{D}\right\}^{\frac{1}{2}}$$

where

$$D = \frac{E t_p^3}{12(1 - \nu^2)}$$

where E = Young's modulus,

ν = Poisson's ratio,

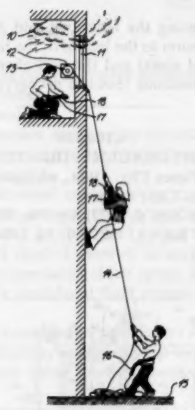
t_p = thickness, all of the selected face sheet.

4,106,589

DEVICE ADAPTED TO BE FASTENED TO A WIRE, A CABLE, A CORD, OR A SIMILAR FLEXIBLE ELONGATED ELEMENT

Knud William Petersen, and John Petersen, both of Rogle, Gronholt, 3480 Fredensborg, Denmark

Filed Jan. 21, 1977, Ser. No. 760,990
Claims priority, application Denmark, Jan. 23, 1976, 280/76
Int. Cl.[2] A62B *1/14*
U.S. Cl. 182—5 **9 Claims**



1. A device adapted to be fastened to a wire, a cable, or cord or a similar flexible elongated element, said device comprising a base member, an element engaging member mounted on said base member so as to be rotatable about an axis in at least one direction in relation to the base member, and means for preventing rotational return movement of the element engaging member, said element engaging member defining at one end an open channel or slot extending transversely to said axis and being adapted to receive part of said elongated element, whereby, when inserted in said channel, the elongated element may be wound around a portion of the element engaging member located between said one end and said base member by rotating the same in said one direction, said element engaging member comprising one or more radially outwardly extending parts positioned between said one end and said portion of the element engaging member.

4,106,590

COMBINED HAND TRUCK AND LADDER

Phil Keith Tarran, Carlsbad, Calif., assignor to Lords III Research & Development Co., Escondido, Calif.

Filed Mar. 21, 1977, Ser. No. 779,334
Int. Cl.[2] B62B *1/20*
U.S. Cl. 182—20 **2 Claims**

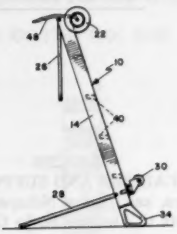
1. A combined hand truck and ladder, comprising:

a frame having a pair of elongated side rails with longitudinally spaced interconnecting cross braces fixed therebetween;

said frame having an upper end and a lower end, with a load supporting foot projecting from the lower end;

wheels rotatably mounted on said lower end;

a back frame member having one end pivotally attached to and between said side rails adjacent the upper end of said frame, said back frame being movable between a closed position within said frame, an extended position substantially perpendicular to the frame, and a further extended position projecting longitudinally beyond said upper end;



locking means for locking said back frame in each of the positions;

said frame having hand grips extending from the upper end beyond the pivotal attachment of said back frame;

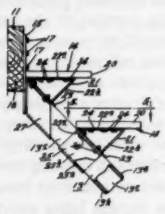
said back frame in the perpendicular extended position and said hand grips, in an inverted position of the frame, providing support members for holding the frame in a free standing ladder configuration.

4,106,591

KNOCK-DOWN OPEN RISER STAIRWAY

Allen Cohen, Havertown; Howard Cohen, and Ronald Cohen, both of Broomall, all of Pa., assignors to M. Cohen & Sons, Inc., Broomall, Pa.

Filed Apr. 13, 1977, Ser. No. 787,089
Int. Cl.[2] E04F *11/12*
U.S. Cl. 182—93 **7 Claims**



1. A stairway, comprising:

an elongated main support member having a non-circular transverse cross section with top, bottom and side walls;

means carried at opposite ends of said support member for mounting said support member in inclined relation between different levels of a structure;

a plurality of independent step assemblies extending laterally from both sides of said main support member carried in spaced relation on said support member;

each step assembly including:

a tread support having a mounting flange engaging the top of said support member,

a locking sleeve having a bottom web and side webs engaging respectively the bottom and side walls of said support member, and

means fastening said locking sleeve to said tread support mounting flange to provide a clamping action on the support member,

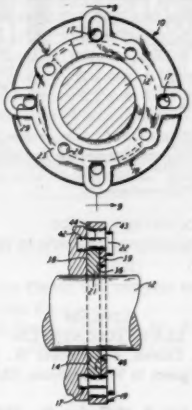
whereby the step assemblies are securely fastened to the support member.

4,106,592

ROD OILER ASSEMBLY

Gerald Eugene Siems, Davenport, Iowa, assignor to J. I. Case Company, Racine, Wis.

Filed May 17, 1977, Ser. No. 797,614
Int. Cl.[2] F16N *7/12*
U.S. Cl. 184—25 **5 Claims**



1. A rod oiler assembly for use with a support member having a planar end surface with a central opening extending therethrough and having holes spaced around said opening and having a rod axially movably mounted on said support member and extending through said central opening, comprising an annular oiler member for snugly endlessly surrounding said rod to be in abutment with said support member end surface, an open-center retainer member for co-axially surrounding said rod and being in abutment with said oiler member on the side of said oiler member away from said support member end surface for pressing said oiler member against said support member end surface, said retainer member having openings extending therethrough and located at different radial distances thereon with respect to the axis of said retainer member to present variable alignments with various said support member holes and thereby have only one of said retainer members accomodate a variety of said support members where said support member holes are located within a range of radial positions, and removable fastener means extending through said retainer member openings and extendable into said support member holes for removable attachment of said retainer member onto said support member end surface.

4,106,593

METHODS AND TOOLS FOR SERVICING AN ELEVATOR SYSTEM

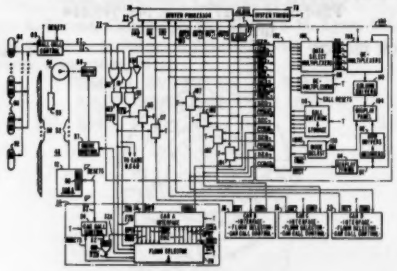
Paul R. Otto, Marlboro, N.J., and Alan F. Mandel, Pittsburgh, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 17, 1977, Ser. No. 778,831
Int. Cl.[2] B66B *3/00*
U.S. Cl. 187—29 R **20 Claims**

1. A method of servicing an elevator system which includes a plurality of elevator cars mounted in a building, and a supervisory system processor which makes assignments to the elevator cars responsive to system conditions and a predetermined strategy, comprising the steps of:

providing a visual display which displays the assignments made to the cars by the system processor,

providing means for selectively entering calls for elevator service,
inhibiting the elevator cars from moving,



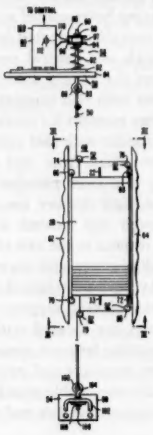
entering a call for elevator service,
and observing the assignments made to the cars by the system processor.

4,106,594

ELEVATOR SYSTEM

Andrew F. Kirsch, Edison, and Robert W. Koob, Hopatcong, both of N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 8, 1977, Ser. No. 785,978
Int. Cl.[2] B66B *13/24*
U.S. Cl. 187—29 R **7 Claims**



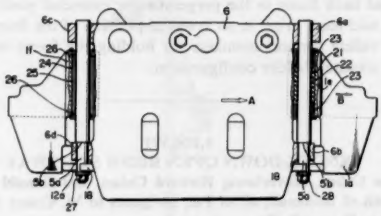
1. An elevator system, comprising:
a building having a plurality of floors and a hoistway,
an elevator car,
a counterweight,
means mounting said elevator car and said counterweight for guided vertical movement in the hoistway of said building, in adjacent vertical travel paths,
motive means for driving said elevator car and said counterweight in their respective travel paths,
cable guide means fixed to said counterweight,
a cable strung in said hoistway, with said cable being reeved about the cable guide means on said counterweight,
tension means providing a predetermined tension in said cable when the counterweight is mounted to operate in its normal vertical travel path, with said tension changing in response to an abnormal lateral deviation of said counterweight from its vertical travel path,
and detector means responsive to the tension in said cable,
said detector means modifying the operation of said motive means in response to a predetermined change in the tension in said cable.

4,106,595

DISC BRAKE CALIPER AND SUPPORTING MEMBER

Toshihiko Kimura, and Tsuneo Nakayama, both of Iwatsuki, Japan, assignors to Akebono Brake Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 631,675, Nov. 13, 1975, abandoned.
This application May 23, 1977, Ser. No. 799,786
Int. Cl.[2] F16D *65/02*
U.S. Cl. 188—73.3 **3 Claims**



1. A disc brake for a vehicle comprising:
a rotatable disc rotor;
a caliper having an operating portion on one side of said disc rotor, a reacting portion on the other side of said disc rotor and a pair of ear portions respectively located on both sides of said caliper in peripheral directions of said rotor and on opposite sides of said disc rotor;
a support member fixed to a stationary portion of said vehicle on said one side of said disc rotor, said support member including a pair of arms extending in a radial direction with a space defining an opening between said arms, guide grooves provided on said arms facing each other in said opening, a boss portion being provided on each of said side arms and each boss portion being respectively provided with a supporting hole extending parallel with the axis of said disc rotor, and peripheral walls extending from the outer ends of said arms in the axial direction of said disc rotor beyond the outer periphery of said disc rotor, said peripheral walls having ends, said ends of said peripheral walls being provided with torque receiving faces;
a pair of pins engaged with said supporting holes of said support member and openings in said ear portions of said caliper for guiding said caliper in the axial direction of said disc rotor; and
a pair of friction pads positioned on opposite sides of said disc rotor, one of said friction pads having a back plate being provided with protrusions slidably engaging said guide grooves of said support member and the other of said friction pads having a back plate being supported by said pins positioned between said reacting portion of said caliper and respectively one of said pair of said ear portions located on said other side of said disc rotor so as to permit slidable engagement with said torque receiving faces.

4,106,596

HYDROPNEUMATIC SINGLE TUBE SHOCK ABSORBER, IN PARTICULAR STEERING SHOCK ABSORBER

Erwin Hausmann, Wuppertal, Fed. Rep. of Germany, assignor to Firma August Bilstein, Ennepetal-Altenvoerde, Fed. Rep. of Germany

Filed Nov. 8, 1976, Ser. No. 739,552

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1975, 2551516

Int. Cl.² F16F 9/06, 9/40

U.S. Cl. 188—314 **4 Claims**

1. A hydropneumatic tube shock absorber, particularly adapted for use as a steering shock absorber comprising a damper cylinder partially filled with highly compressed gas and operating fluid; said pressure being such as to avoid foaming of said fluid in the normal course of shock absorber operation; a working piston movably mounted in said cylinder in said operating fluid; a piston rod sealingly passing through one end of said cylinder; a partition rigidly installed between the highly compressed gas and the working piston in said operating fluid; said partition being provided with valves that open during the working piston outward and inward movements respectively; the valve opening during the outward movement of the piston rod having a closing force which is substantially greater than the closing force of the valve which opens during the inward movement of the piston rod; the first-mentioned closing force being approximately equal to the product of the pressure of such highly compressed gas and effective cross-section of such outward movement partition valve.

4,106,597

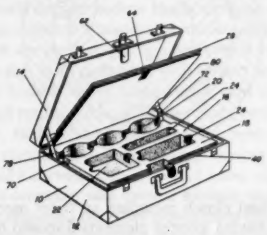
EXECUTIVE FOOD CARRYING CASE

Robert L. Shook, and Howard D. Sirak, both of Columbus, Ohio, assignors to Executive Products Corporation, Columbus, Ohio

Filed Oct. 14, 1977, Ser. No. 842,064

Int. Cl.² A45C 11/20

U.S. Cl. 190—42 **3 Claims**



1. A food carrying attache' case comprising:

(a) an attache' case including a main base member and a top hingedly secured thereto at co-extensive edges;

(b) a block of insulative material removably positioned in said base member, said insulative material having a plurality of food receiving cavities formed into one of its major surfaces which faces said top; and

(c) a covering lid above said major surface of said block of insulative material and pivotally mounted thereto for, at times, protectively covering and retaining food in said cavities, said cover lid having an exterior top surface which is sufficiently smooth and flat to form a writing work surface and which is spaced from the interior of said top when said top is closed, first pressure responsive means for holding said lid in an open position when said lid is opened, and second pressure responsive means for holding said lid on said block and retaining food in said cavities when said lid in closed.

4,106,598

COMPARTMENTAL LUGGAGE CASE AND METHOD OF MAKING

Michael Davis, New Castle, Pa., assignor to Airway Industries, Inc., Ellwood City, Pa.

Filed Sep. 7, 1977, Ser. No. 831,112

Int. Cl.² A45C 13/02

U.S. Cl. 190—52 **3 Claims**

1. In a luggage case of the compartmental type having a substantially rectangular frame of formed wood and two compartments therein respectively accessible from opposite sides of the frame, the improvement comprising a partition member of a semi-rigid sheet material smaller in area than the projected area of said frame and so disposed intermediate the opposite edges of said frame as to provide top and bottom sides, and a strip of elasticized fabric means in a closed loop completely surrounding and attached to the peripheral edge of the said partition member, said fabric means being stretched tautly in opposite directions from the partition member over the side edges of the said frame and attached to the outer surface of the said frame.

4,106,599

ELECTRIFICATION RAIL AND JOINT CONSTRUCTION

Alleyne C. Howell, Jr., 645 Mine Hill Rd., Fairfield, Conn. 06430

Filed Aug. 29, 1977, Ser. No. 828,837

Int. Cl.² B60M 1/34

U.S. Cl. 191—27 **25 Claims**

1. A conductor rail joint, comprising in combination:

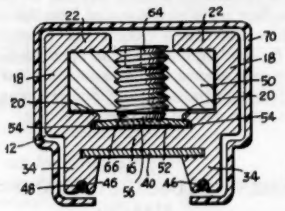
(a) a pair of extruded metal rail members having juxtaposed and aligned end portions,

(b) said end portions being provided with aligned T-slots, and having bottom walls and side walls including longitudinally extending spaced-apart integral shoulder means in said slots adjacent the bottom walls thereof, and also flanges which are opposite the bottom walls and which define the openings of the T-slots.

(c) a connector block and a clincher strip extending into the

T-slots of said rail end portions, said clincher strip being disposed between said block and the bottom walls of said end portions and having opposite longitudinal edges engaged with said shoulder means, said strip being preformed to an arcuate transverse cross section so as to locate center portions thereof closer to said block than said longitudinal edges,

(d) operable pressure members carried by said block and engagable with said center portions of the clincher strip to



flatten and spread the longitudinal edges of the latter such that they forcibly abut and wedge into said longitudinally-extending shoulder means, and

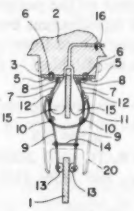
(e) hard metal contact liner strips carried by the rail members closely adjacent those sides of the bottom walls which are opposite to said shoulder means, said clincher strip thus maintaining close alignment of both the shoulder means of the adjacent rail members and of the contact liner strips thereof.

4,106,600

CURRENT COLLECTING SYSTEM FOR VEHICLE

Kiyoshi Mihirogi, Odawara, Japan, assignor to Japan Air Lines, Co., Ltd., Tokyo, Japan

Filed Apr. 7, 1977, Ser. No. 785,541
Claims priority, application Japan, Feb. 28, 1977, 52-020193
Int. Cl.² B60L *5/08*
U.S. Cl. 191—59.1 **6 Claims**



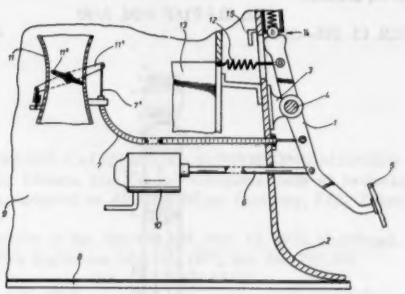
1. A current collecting system for a vehicle, comprising a power supply member having two parallel surfaces, at least one expander unit which is inflatable with a pressurized medium, at least a pair of support members adapted to hold said inflatable expander unit therebetween and each having one end thereof pivotably connected to said vehicle, a pair of contact members each carried on the other ends of said support members to hold said power supply member therebetween, and control means which brings said contact members into and out of pressing engagement with said power supply member when said expander unit is inflated and deflated, respectively.

4,106,601

CONTROL DEVICE

Walter Fischer, Melle, Fed. Rep. of Germany, assignor to WF "Rational" Anbaükuchen Walter Fischerriemsloh, Melle, Fed. Rep. of Germany

Filed Apr. 4, 1977, Ser. No. 783,932
Int. Cl.² F16D *67/00*
U.S. Cl. 192—3 S **5 Claims**



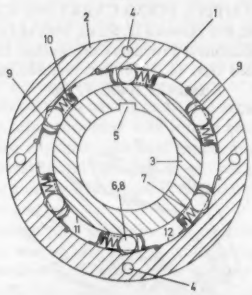
1. Mechanism, for the control of the fuel feed and for the application of the brakes of front or rear engine driven motor vehicles with manual or automatic gear boxes, comprising a single spring-loaded foot lever in form of a pedal in arrested idling position, said pedal being connected via transmission means both to a fuel feed and to a brake mechanism such that, when the pressure on the pedal is released from the idling position, the fuel feed is opened continuously, and such that when the pedal is depressed completely, the fuel feed is throttled to the idling position, and such that when the pedal is depressed beyond the idling position, the brake mechanism is put into continuous operation, and such that when the pressure on the pedal is released, the brake mechanism is put out of operation.

4,106,602

FREE-WHEEL CLUTCH

Friedhelm Dieckermann, Plankstadt, Fed. Rep. of Germany, assignor to Borg-Warner-Stieber GmbH, Heidelberg, Fed. Rep. of Germany

Filed Jan. 27, 1977, Ser. No. 763,193
Claims priority, application Fed. Rep. of Germany, Feb. 6, 1976, 2604567
Int. Cl.² F16D *15/00*
U.S. Cl. 192—45 **15 Claims**



1. A free-wheel clutch including an outer member and an inner member having gripper elements disposed between said outer and inner members and having springs engaging said gripper elements urging said gripper elements toward engagement with said outer and inner members characterized in that

a gripper element (6) and its associated spring (10) are disposed within a segmental cage member (7, 29, 43, 56, 65, 80,), said segmental cage member being formed from a sheet metal blank, a group of said cage members being circumferentially disposed within said clutch (1).

4,106,603

ARRANGEMENT FOR DRIVING A WORKING SHAFT BY TWO COMBUSTION ENGINES

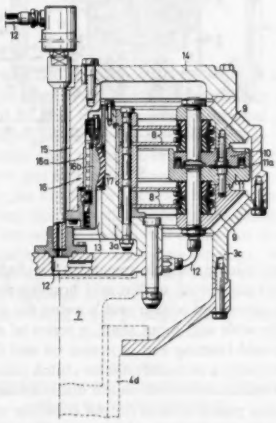
Jürgen Walter, Wanne-Eickel, Fed. Rep. of Germany, assignor to Vulkan Kupplungs -und Getriebebau Bernhard Hackforth, Wanne-Eickel, Fed. Rep. of Germany

Filed Mar. 24, 1976, Ser. No. 669,879

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1975, 2514029

Int. Cl.² B63H *23/30*

U.S. Cl. 192—85 AB **10 Claims**



1. In a transmission system for transmitting drive from at least two internal combustion engines to a single driven shaft, a single clutch associated with each said engine, each said clutch having a hub part and a housing part, said housing part carring fixed friction elements, an intermediate shaft connected to said hub part of each clutch and, in use, connected to its associated engine through a flexible coupling, a hollow shaft connected to said housing part of each clutch, said intermediate shaft extending along and through its associated hollow shaft whereby each clutch is remote from its associated engine, a gear housing, each of said hollow shafts passing through said gear housing, a gear wheel fixed to each hollow shaft, a gear train in said gear housing connected to said single driven shaft, said gear wheels on said hollow shafts meshing with said gear train, the improvement wherein said movable friction elements of each clutch are yieldingly connected to said hub part so that they are movable in all directions with respect to said hub part, each of said hollow shafts being rigidly and co-axially connected on said respective housings, a rolling bearing in each of said clutches, each rolling bearing having inner rings fixed to one of said clutch parts, each rolling bearing having outer rings, an axially curved surface on said outer rings, thin resilient cushions covering said curved surface, and said curved outer surface engaging the other clutch parts through said thin resilient cushions, whereby said hub parts of each clutch are centered substantially non-yieldingly in a radial direction on their respective clutch axes to permit small angular movements of said intermediate shafts with respect to said hollow shafts.

4,106,604

CONTROL UNIT FOR THROTTLE AND CLUTCHES

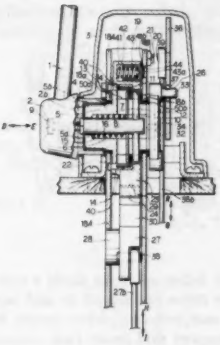
Masanao Baba, Takarazuka, Japan, assignor to Nippon Cable System Inc., Japan

Filed Apr. 20, 1977, Ser. No. 789,255

Claims priority, application Japan, Dec. 20, 1976, 51-153751

Int. Cl.² B60K *21/00*; G05G *13/00*

U.S. Cl. 192—0.098 **11 Claims**



1. A single lever engine control unit comprising:

a. a frame member having first engaging means;

b. a drive shaft rotatably supported by the frame member and having relatively elongated second engaging means extending substantially across its axis and an axial bore extending therethrough;

c. a lever member having a boss portion engaging the drive shaft and slidable axially of the drive shaft;

d. a shift rod secured to the boss portion of the lever member concentrically therewith and inserted in the axial bore of the drive shaft, the shift rod having third engaging means and retaining means juxtaposed with the third engaging means, the third engaging means being in engagement with the second engaging means of the drive shaft at all times;

e. locking means retained by the retaining means on the shift rod and having fourth engaging means, the locking means loosely fitting around the drive shaft, the fourth engaging means being engageable with the first engaging means of the flame member by the movement of the lever member only when the drive shaft is in its neutral position;

f. a drive member turnably supported by the drive shaft and having a toothed portion and a circular outer peripheral edge continuous with the toothed portion, the drive member having fifth engaging means for selective engagement with the third engaging means on the shift rod and sixth engaging means in engagement with the fourth engaging means of the locking means at all times;

g. a clutch actuating member turnably supported by the frame member and having a toothed portion engageable with the toothed portion of the drive member and inwardly curved locking edges continuous with the toothed portion and slidingly engageable with the circular peripheral edge;

h. a clutch rod pivoted to the clutch actuating member;

i. a driven member secured to the drive shaft and having at least one bore;

j. a drive pin mounted in the bore of the driven member;

k. a throttle operating member turnably supported by the frame member and having a cam aperture for receiving the drive pin therein, and

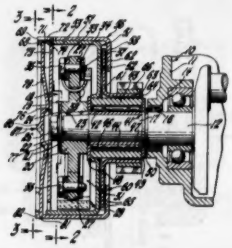
l. a throttle rod pivoted to the throttle operating member.

4,106,605

CENTRIFUGAL AND ONE WAY CLUTCHES IN SERIES WITH FRICTION CLUTCH

Frank J. Winchell, Orchard Lake, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 13, 1976, Ser. No. 749,917
Int. Cl.[2] F16D *43/14, 21/08, 41/04*
U.S. Cl. 192—105 CD 4 Claims



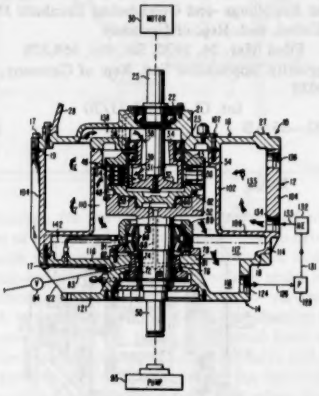
1. In a multiclutch drive: an input shaft; a one-way clutch having an inner race drive connected to said input shaft, an outer race, bearing and one-way drive means between said races to rotatably support said outer race concentrically on said inner race and to provide engagement for drive when said outer race overruns said inner race in the normal drive direction and disengagement when said inner race overruns said outer race in the normal drive direction, and thrust means to prevent axial movement of said races relative to said input shaft; a centrifugal clutch having a hub mounted on said input shaft for rotation with said input shaft, an inner drum having an inner cylindrical portion with an internal cylindrical friction surface concentric with said hub and with a free end, said inner drum also having a disk portion extending radially inward from the opposite end of said inner cylindrical portion and fixed to said outer race to provide a drive connection and to axially ground said inner drum, said disk portion having an external friction surface backing plate disk portion, clutch shoes pivoted on said hub, spring biasing means connected to said hub and clutch shoes to bias said clutch shoes to a disengaged position, and said clutch shoes rotating with said input shaft and hub and operative in response to input shaft speed above idle speed to provide a centrifugal bias force for starting torque drive to provide slipping drive and then at higher torque input speed provide lock-up drive as centrifugal clutch torque meets drive torque requirements; an outer drum having an outer cylindrical portion supported on said inner cylindrical portion of said inner drum for relative axial movement with a free end and with a clutch apply plate disk portion at the opposite end extending radially inwardly and facing said backing plate disk portion; a clutch driven disk plate positioned between said backing plate disk portion and apply plate disk portion providing a manual clutch; an output member drive connected to said clutch driven disk plate; a manual clutch actuator member secured to said free end of said outer drum and extending across the center of said drums and having a clearance relation with said inner drum, said centrifugal clutch and input shaft during movement between engaged and disengaged positions; said inner cylindrical portion having abutment recesses; said outer cylindrical portion end having spline recesses; a belleville spring having outer spring fingers engaging in said abutment recesses to axially locate and ground the outer perimeter of said belleville spring through said inner drum and one way clutch to said input shaft and extending through said abutment recesses and spline recesses with axial clearance relative to said outer drum for said axial movement of said outer drum to cause said inner and outer drums to rotate together and permit axial engaging and disengaging movement of said outer drum relative to said axially grounded inner drum for engaging and disengaging said manual clutch and said belleville spring having an inner portion engaging said manual clutch actuator member to bias said actuator member and outer drum to engage said manual clutch; and manual means engaging said actuator member to move said actuator member and outer drum against the belleville spring bias to disengage said manual clutch.

4,106,606

VARIABLE SPEED DRIVE

Halsey W. Cory, Fairfield, Ohio, assignor to Force Control Industries, Inc., Hamilton, Ohio

Filed Dec. 15, 1976, Ser. No. 750,681
Int. Cl.[2] F16D *13/60*
U.S. Cl. 192—113 B 15 Claims



1. In a controllable variable speed drive including a housing, an input shaft supported within said housing for rotation, an output shaft supported within said housing for rotation generally coaxially with said input shaft, a series of annular clutch discs within said housing and mounted on said input shaft for rotation therewith, a series of annular clutch plates arranged in interfitting relation with said clutch discs, means for connecting said clutch plates to said output shaft for rotation therewith, means for applying an axial compressive force to said interfitting discs and plates for selectively coupling said input shaft to said output shaft, and said interfitting discs and plates defining spaces therebetween for receiving a flow of oil to maintain an oil film between adjacent discs and plates and to remove heat therefrom, the improvement wherein said housing comprises an inner wall surrounding said clutch discs and plates and defining a collecting chamber for receiving the oil flowing outwardly between said discs and plates, said housing further including an outer wall spaced radially outwardly from said inner wall and cooperating therewith to define a reservoir chamber therebetween, means for directing oil from said collecting chamber into said reservoir chamber, and means for directing a supply of oil from said reservoir chamber into said annular clutch discs carried by said input shaft.

4,106,607

PNEUMATIC SAFETY SYSTEM FOR MACHINE ENCLOSURES

Charles Arthur Badavas, Allendale, N.J., assignor to American Can Company, Greenwich, Conn.

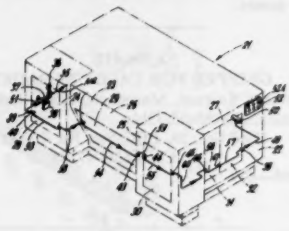
Filed Mar. 2, 1977, Ser. No. 773,497
Int. Cl.[2] G08B *1/04*
U.S. Cl. 192—129 B 11 Claims

1. A pneumatic safety system comprising an enclosure having a first and second enclosure portions, which enclosure portions are movable into open and closed positions relative to each other, a source of compressed gas connected to said enclosure, a first gas line connected to said source of com-

pressed gas, transducer means connected to said enclosure to convert a decrease in gas pressure into a control signal, a second air line connected to said transducer means,

a first gas connector member mounted on said first enclosure portion, said first gas connector member comprising a body portion, a bore through said body portion and connected to either one of said first or second gas lines, a flat face portion on said body portion and a round orifice in said flat face portion leading to said bore,

a second gas connector member mounted on said second enclosure portion, said second gas connector member comprising a body portion, a bore partly through said



body portion and connected to said other of said first and second gas lines, a cavity within said body portion and connected to said bore, the cross-sectional area of said cavity perpendicular to the direction of gas flow therein being greater than the cross-sectional area of said orifice of said first gas connector member,

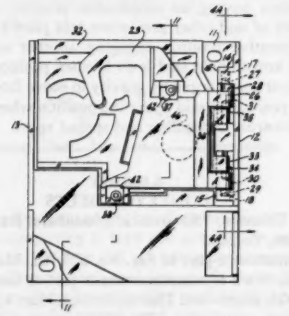
said second gas connector member having a normally flat face portion which is in gas sealing relationship relative to said flat face portion of said first connector member in the closed position of said enclosure portions, said flat face portion having a central opening and a plurality of slots extending from said central opening, said slots and central opening providing a gas passage to said cavity.

4,106,608

GATE ASSEMBLY FOR A COIN SELECTING AND SEPARATING DEVICE

Kristen H. Dietz, Florissant, Mo., assignor to Coin Acceptors, Inc., St. Louis, Mo.

Division of Ser. No. 774,252, Mar. 4, 1977. This application Nov. 4, 1977, Ser. No. 848,506
Int. Cl.² G07F *1/00*
U.S. Cl. 194—1 R **8 Claims**



1. A gate assembly for a coin accepting and separating device, comprising:

(a) a main plate means,

(b) a first gate hingedly connected to the main plate means and movable selectively between an open position away from the main plate means and a closed position adjacent to the main plate means,

(c) a second gate hingedly connected to the main plate means, and located between the first gate and the main plate means, the second gate being movable selectively between an open position away from the main plate means and a closed position adjacent the main plate means,

(d) resilient means between the gates and tending to urge the gates apart, and

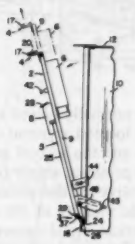
(e) latch means on the main plate means and selectively holding the first gate in its closed position, and the resilient means holding the second gate in its closed position.

4,106,609

REMOVABLE FRONT PANEL

Don G. Kaspar, Shiner, Tex., assignor to Kaspar Wire Works, Inc., Shiner, Tex.

Filed Oct. 27, 1976, Ser. No. 736,166
Int. Cl.² G07F *5/02*
U.S. Cl. 194—1 B **7 Claims**



1. A vending machine, comprising in combination:

a cabinet having a removable front panel;

a dispenser door hingedly connected to said panel;

a coin mechanism and a latch mounted to said panel for releasing said latch upon insertion of a predetermined amount of coins into said coin mechanism to enable the opening of said dispenser door;

pivot means including a peg secured in a fixed relation to one of said front panel and said cabinet and positioned to be removably inserted into a corresponding aperture located in the other of said front panel and said cabinet;

said peg being pivotable in said aperture enabling said front panel to be pivoted forward and removed from said cabinet;

panel lock means comprising a projecting portion having an aperture and extending from one of said front panel and said cabinet of the vending machine; and

an aperture in the other of said front panel and said cabinet and established to be coincident with said aperture in said projecting portion when said front panel is in the closed position enabling a padlock to be inserted through said apertures to lock said front panel the said cabinet.

4,106,610

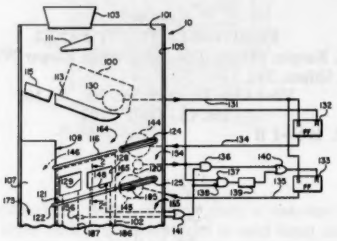
COIN APPARATUS HAVING MULTIPLE COIN-DIVERTING GATES

Frederic P. Heiman, Delran, N.J., assignor to Mars, Incorporated, Mc Lean, Va.

Filed Jun. 7, 1976, Ser. No. 694,050
Int. Cl.² G07F *3/00*
U.S. Cl. 194—97 R **12 Claims**

1. An improved coin apparatus comprising a structure defining a coin path, a coin tester for producing a first electrical signal indicative of coin acceptability, a cash box, a coin container for coins of a single denomination, a coin container filling apparatus, a first gate located downstream of the coin tester, the first gate being moveable between a first position

permitting coins on the coin path to enter only a rejected coin path and a second position permitting coins on the coin path to enter only an accepted coin path, first activator means responsive to the first electrical signal for causing the first gate to move between the first and second positions, a second gate located downstream of the first gate in the accepted coin path, the second gate being moveable between a first position permitting coins on the accepted coin path to enter only a passageway leading directly to the cash box and a second position permitting coins on the accepted coin path to enter only a coin container filling apparatus passageway, second activator means for causing the second gate to move from the first



position in which it is normally biased to the second position, a coin presence sensor located adjacent the accepted coin path between the first gate and the second gate, and circuit means responsive to the coin presence sensor for producing a second electrical signal indicative of the presence of an acceptable coin on the path in the vicinity of the coin presence sensor, wherein the first electrical signal causes the second activator means to be energized thereby moving the second gate from its first position to its second position, and first time delay means initiated by the second electrical signal for deenergizing the second activator means a predetermined period of time after a coin is first detected by the coin presence sensor.

4,106,611

SERIAL PRINTING APPARATUS

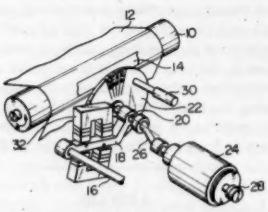
Takami Suzuki, and Nobuo Iwata, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 29, 1975, Ser. No. 644,987

Claims priority, application Japan, Dec. 28, 1974, 50/1291; Aug. 6, 1975, 50/94954; Aug. 18, 1975, 50/99933

Int. Cl.[2] B41J *1/30*

U.S. Cl. 400—144.2 **12 Claims**



1. Printing apparatus comprising, in combination:

at least two rotary hubs rotatable and shiftable to a printing position;

a plurality of resilient tongues extending generally radially from each of the rotary hubs;

type members provided on the tongues at predetermined distances from the rotary hubs;

first drive means for rotating the rotary hubs so that a selected one of the tongues is in a predetermined angular position;

a second drive means for moving the rotary hubs in a direction parallel to an axis of the selected tongue so that a selected type member on the selected tongue is in a predetermined linear position, and

a universal joint comprising a first member connected to the first drive means, a second member connected to the rotary hubs, and link means comprising a link formed with first and second slots to receive the first and second members respectively, a presser member, and biasing means urging the presser member to engage with the first and second members perpendicular to the axes thereof and press the first and second members against inner walls of the link defining the first and second slots, whereby to compensate for movement of the rotary hub by the second drive means.

4,106,612

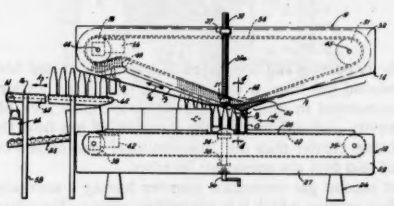
GRIPPER FOR CASE UNLOADER

Heinz Albrecht Koerner, Macedonia, Ohio, assignor to MBI Corporation, Northfield, Ohio

Filed Sep. 24, 1976, Ser. No. 726,117

Int. Cl.[2] B65G *47/86*

U.S. Cl. 198—479 **7 Claims**



1. A gripper comprising,

two arms pivoted intermediate their ends to form tongs having opposed jaws at their lower ends,

a support,

links pivoted to said support and pivoted to respective upper ends of said arms to connect said tongs to said support,

said jaws having a closed position when said tongs and links are extended away from said support and an open position when said tongs are moved toward said support,

and a detent movably mounted in a hole in one of said arms and engageable with the other of said arms to hold said jaws in open position after said jaws are moved toward said support, said hole lying at an angle to horizontal when said gripper is in a normal position with said tongs depending from said support,

said detent having an inoperative position engaging one surface of said other arm when said jaws are closed, and an operative position engaging another surface of said other arm to hold said jaws in open position,

said detent being urged by gravity to move from said inoperative position to said operative position when said jaws are downwardly depending and spread apart.

4,106,613

CONVEYOR BELTS

Ian Main Thomson, "Silverstock", Sandhurst Rd., Wokingham, Berkshire, England

Continuation-in-part of Ser. No. 575,782, May 8, 1975, abandoned, which is a continuation-in-part of Ser. No. 381,567, Jul. 23, 1973, abandoned. This application Mar. 4, 1977, Ser. No. 774,490

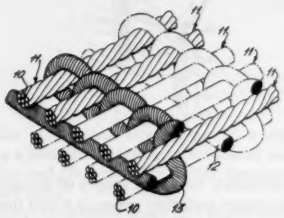
Claims priority, application United Kingdom, Aug. 11, 1972, 37679/72

Int. Cl.[2] B65G *15/34*

U.S. Cl. 198—847 **8 Claims**

1. A conveyor belt adapted to be supported and driven by ropes adjacent its edges, the belt comprising a body of rubber

provided with formations adjacent its edges extending above and below the belt and adapted to be engaged by respective ropes to support and drive the belt, at least two sheets of open construction woven synthetic fabric embedded in said body, said sheets being coextensive longitudinally of the body and coextensive laterally of the body and coextensive with said formations adjacent the edges and being spaced apart from each other in the direction of the thickness of the body by a major portion of the thickness of the body of rubber, each of said sheets including two layers of a plurality of laterally extending flexible tensile and compressive force resisting yarns and plural longitudinally extending spacing strands positioned between and separating the two layers and spaced from each



other a greater distance than said yarns, said yarns being disposed substantially parallel to each other along the body and extending for at least part of their length in a substantially straight line, said yarns each consisting of a plurality of synthetic filaments of polyethylene terephthalate spun or twisted together and being bonded directly to the rubber in proximity to the outer faces of the belt, said filaments having a modulus of elasticity exceeding 100,000 pounds per square inch and being of large diameter in the range of 0.001 to 0.100 inch, and said body of rubber penetrating into and through said two sheets of open construction fabric to mechanically interlock with said yarns, whereby both tensile and compressive forces produced by the transverse bending of the belt are resisted by the filaments while shear forces are absorbed by the rubber.

4,106,614

ARTIFICIAL FINGERNAIL DISPLAY PACKAGE

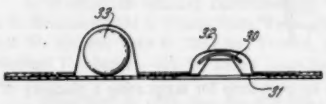
Eric Victor Aylott, Llanfrechfa Way,, Cwmbran, Gwent NP4 2XR, Wales

Continuation-in-part of Ser. No. 766,829, Feb. 8, 1977. This application Jun. 9, 1977, Ser. No. 805,218

Claims priority, application United Kingdom, Oct. 27, 1976, 44641/76

Int. Cl.[2] B65D *5/50*

U.S. Cl. 206—45.14 **7 Claims**



1. A package for the storage, handling and display of artificial fingernails comprising at least one artificial fingernail having a rear securing surface and a front surface, support means for fixedly positioning each said fingernail, packaging means for defining an enclosure surrounding each said fingernail, said packaging means including opposed transparent walls respectively disposed above and below the front and rear surfaces of each fingernail, said opposed transparent walls being dimensioned with respect to each said fingernail to permit the entire fingernail to be viewed and further permit a natural fingernail to be placed in substantially flush alignment against the wall below the rear surface of said artificial fingernail so that a size comparison and observance of the attractiveness of the artificial fingernail can be effected without removing the fingernail from said enclosure defined by said packaging means.

4,106,615

BOX BLANK AND ASSEMBLED PACKAGE BOX FOR DISPLAY

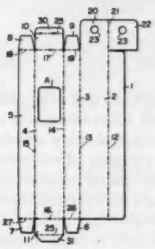
Suzuki Hiroshi, Sagamihara, Japan, assignor to Lion Hamigaki Kabushiki Kaisha, Japan

Filed Feb. 6, 1976, Ser. No. 655,935

Claims priority, application Japan, Feb. 6, 1975, 50-17304[U]

Int. Cl.[2] B65D *25/54*

U.S. Cl. 206—45.31 **18 Claims**



1. A box blank for assembly into a package box for display including:

a side flap to be bonded for forming a basic box structure;

a back, a front and two side sections integral with said side flap and defined by respective parallel sectioning scored lines for folding therearound in the assembly of said package box, said back, front and two side sections constituting the sides of said box;

top and bottom end sections each extending from said front section and individually defined by respective sectioning lines between said end sections and said front section, said end sections constituting the top and bottom of the box respectively, said top end section having a marginal flap defined by an end sectioning line between said top end section and said marginal flap;

a hanger portion for forming a hanger above said basic box structure, said hanger portion comprising a first hanger portion flap extending from said back section, said first hanger portion and back section being free of sectioning lines therebetween; and

a second hanger portion flap having a shape substantially conforming to the shape of said first flap and extending from a portion of said first hanger portion flap, and positioned adjacent to said side flap and defined by an extended substantially straight sectioning line defining said back section from said side flap and shaped so that it may be brought into registry with said first hanger portion flap;

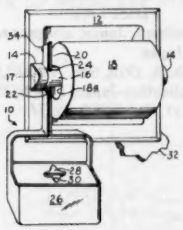
at least said sectioning lines defining said back section and said end sectioning line defining said top end section marginal flap being formed with dash cuts;

said hanger portion being apertured for convenience in hanging said package box therefrom, said package box comprising a basic box structure for holding a packaged item and a hanger portion above said basic box structure, said hanger portion being reinforced by the presence of at least two layers of sheet therein, whereby said packaged box assembled from said box blank may be opened by holding said box and pulling away on said hanger portion to rip the section lines weakened by said dash cuts.

4,106,616
DEVICE FOR POSITIONING A CONTAINER OF SUPPLEMENTAL MATERIAL IN OPERATIONAL ALIGNMENT ADJACENT TO A TOILET-TISSUE HOLDER

Philip Boone, 15 Fenwick Rd., Winchester, Mass. 01890

Filed Mar. 18, 1977, Ser. No. 779,136
Int. Cl.[2] B65D *69/00*
U.S. Cl. 206—233 17 Claims



1. A device for supplying and positioning auxiliary material adjacent to a standard toilet-tissue roll dispenser which dispenser comprises a principal body adapted to mounting on a bathroom wall and a plurality of roll holding means including a plurality of laterally spaced support portions integral with said body, each having a bore formed therein adapted to mount therebetween a retractable spindle for releasably carrying the roll of toilet-tissue as well as other means for supporting the device, the roll of toilet-tissue, in addition to being rotatable, being slidable in a direction longitudinally of the spindle by a given amount so that a given space may normally be provided in said direction longitudinally of the spindle between one end of the roll of toilet-tissue and core thereof and one of said spaced support portions, the device comprising:

a preferably substantially rigid arm member;

means forming an effective concavity in an upper portion of said arm member for connecting said upper portion thereof to a given one of said spindle and other supporting means to provide a generally vertical suspension of said arm member;

means providing a lateral space for positioning said upper arm portion between a support portion and said tissue coll

means of a given thickness, at least partially encircling said spindle positioned adjacent to said arm member for fixing said arm member against lateral movement from said given position by occupying said lateral space; longitudinally of the spindle;

limit-stop means fixing said arm member against forward and rearward pivotal movement including upper and lower portions of the arm member adapted to contact given portions of said principal body;

a container having a predetermined located aperture releasably carrying a supply of said auxiliary material; and

means connecting a lower portion of said arm member to said container, the aforesaid means fixing the arm member against movement, serving to provide a firm fixed mounting of the container and a consistently given position of said aperture for facilitating removal of the auxiliary material.

4,106,617
BATHROOM FIXTURE

Philip Boone, 15 Fenwick Rd., Winchester, Mass. 01890

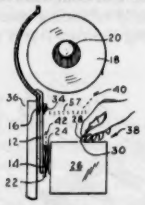
Filed May 19, 1977, Ser. No. 798,465
Int. Cl.[2] B65H *19/02*
U.S. Cl. 206—233 20 Claims

1. A multifunctional bathroom fixture for mounting on a vertical wall, said fixture comprising:

a vertically-disposed first support means adapted to be mounted on said wall, said first support means including means to receive a spindle and a supply of dry toilet-tissue;

a second support means including at least one downwardly extending substantially flat member, said member having its flattened portion parallel to the wall, the upper portion of said member being connected to a lower surface of said first support means;

first fastening means at the lower end of said member, said fastening means being disposed in a plane substantially perpendicular to the flat surface of the member;



a container releasably holding a supply of moistening material, said container including means in a wall thereof forming an aperture through which said material can be withdrawn;

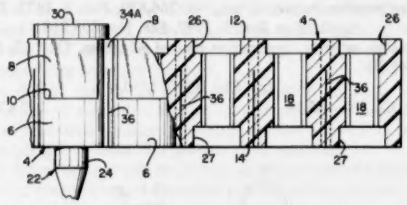
control means to determine the direction of withdrawal of said material; and

second fastening means integral with said container at a surface facing said second support means, said second fastening means including a portion complementary to said first fastening means to enable the container to be fastened thereto.

4,106,618
NAIL ASSEMBLIES

Harry M. Haytayan, Sunnyside La., Lincoln, Mass. 01773

Filed Dec. 15, 1975, Ser. No. 640,587
Int. Cl.[2] B65D *83/02, 85/24, 85/62*
U.S. Cl. 206—343 29 Claims

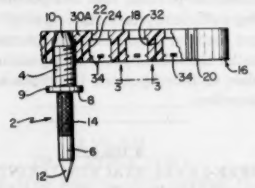


1. A nail support strip for supporting a plurality of nails in series with one another, said strip comprising a series of parallel sleeves each having a first end and a second opposite end, and a plurality of webs each connecting a pair of mutually adjacent sleeves and each having a corresponding first enc and a corresponding second end, said sleeves and said webs being integral with one another and made of the same material, and each web having a line fracture commencing at its first end thereof and extending toward but terminating short of said second end thereof, each web being divided by said fracture line into two parts having mutually confronting edge surfaces with substantially no gap between said edge surfaces, and the height of each web measured between said first and second ends thereof being substantially greater than the thickness of each web.

4,106,619
NAIL CLIPS

Harry M. Haytayan, Lincoln, Mass., assignor to Pneutek, Inc., Billerica, Mass.

Continuation of Ser. No. 715,856, Aug. 19, 1976, abandoned.
This application Sep. 22, 1977, Ser. No. 835,500
Int. Cl.[2] B65D *85/24*
U.S. Cl. 206—346 16 Claims



1. A clip of fasteners comprising (1) a support strip for supporting a plurality of fasteners in parallel and in series with one another and (2) a plurality of like fasteners supported by said support strip;

said support strip being made of a plastic material and comprising a plurality of like parallel fastener-supporting elements and a plurality of webs each connecting a pair of mutually adjacent fastener-supporting elements, each of said fastener-supporting elements havig a circularly-curved outer surface;

said fasteners each comprising an elongate metal body having first and second opposite ends and a peripheral metal flange surrounding and carried by said body at a selected position intermediate its ends, each of said flanges having a circularly curved outer edge surface having substantially the same radius of curvature as said outer surfaces, each fastener body being pointed at its second end and also being threaded over at least a portion of its length between its first end and the flange which it carries;

each of said bodies being surrounded and gripped at its first end by one of said fastener-supporting elements with the center-to-center distance between each pair of fasteners at said first ends being substantially the same as the center-to-center distance between the same pair of fasteners at the flanges thereof when said flanges are in engagement with each other, each of said fasteners being formed separately from said support strip and also from one another and the flange of each fastener being unattached with respect the flange of each adjacent fastener, and each fastener-supporting element gripping at least a part of the threaded portion of the fastener which it supports.

4,106,620
SURGICAL BLADE DISPENSER

Frances M. Brimmer, 3431 E. Monte Vista, Tucson, Ariz. 85717; Edward W. Ahrens, 4681 E. 32nd St., Tucson, Ariz. 85711, and Herbert C. Magney, 433 W. Linda La., Chandler, Ariz. 85224

Filed Oct. 3, 1977, Ser. No. 838,589
Int. Cl.[2] B65D *83/10*
U.S. Cl. 206—363 2 Claims

1. A surgical blade dispenser for holding at least one surgical blade until ready for use, and for dispensing and attaching said blade to a scalpel handle,

said scalpel handle including an elongate handle portion terminating at its forward end in a narrowed extension forming a blade attaching tip, said tip having an elongate boss carried thereon,

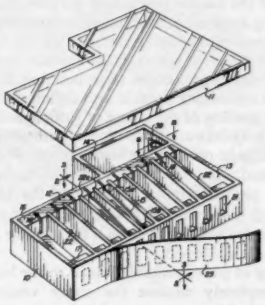
said surgical blade having a sharpened tip and cutting edge portion and a shank portion extending rearwardly therefrom, the shank portion of said blade having an elongate aperture therein shaped and adapted to receive and lockingly engage with said mating elongate boss carried by the attaching tip of said scalpel handle,

said dispenser comprising:

(a) enclosure means defining a box for storing at least one of said surgical blades;

(o) blade positioning means within siad box for frictionally engaging

(i) the tip and at least a portion of the cutting edge of said blade, and

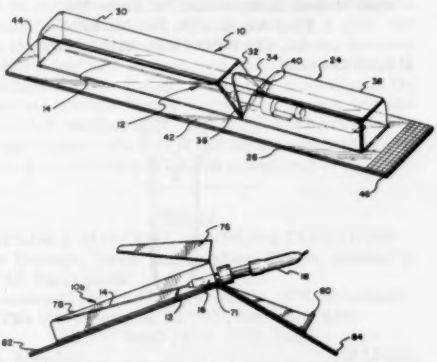


(ii) the shank portion of said blade to position said blade such that the shank portion of said blade curvingly extends toward a wall of said box proximate the shank portion of said blade, said wall having at least one aperture therein sized and shaped to receive the attaching tip of said scalpel handle therethrough, a distance sufficient that the boss of said attaching tip can be inserted and lockingly engaged with the aperture in the shank portion of said blade.

4,106,621
COMBINATION NEEDLE COVER AND VENIPUNCTURE DEVICE TRAY AND METHOD OF USING SAME

James L. Sorenson, Salt Lake City, Utah, assignor to Sorenson Research Co., Inc., Salt Lake City, Utah

Filed Jul. 26, 1976, Ser. No. 708,968
Int. Cl.[2] B65D *73/00, 75/62, 83/02*
U.S. Cl. 206—365 5 Claims



1. A sterile package for venipuncture devices, said package being constructed in part of ductile material so that it can be angularly deformed when opened and comprising:

a top blister cover for the venipuncture device formed of ductile, transparent plastic, said blister cover being pre-

formed to define a needle portion, a handle portion, and a handle restraining portion disposed between the needle portion and the handle portion, said handle restraining portion having a generally parabolic cross-sectional shape of smaller transverse and longitudinal dimensions than said needle and handle portions, said parabolically shaped handle restraining portion also defining a communicating passageway between said needle and handle portions, the needle portion and handle portion also each having a sloped surface that joins the parabolically cross-sectional shaped handle restraining portion so as to converge at the base of the handle restraining portion, thereby defining a bending location at said handle restraining portion which facilitates angular deformation of the top blister cover into an upright tray which fully exposes the handle of the device to finger access after bending the package, said handle restraining portion also defining an opening to the needle portion of the cover of sufficient diameter so as to allow withdrawal of the device without applying significant force to remove the blister cover when it is angularly deformed, said blister cover also having a peripheral flange circumscribing the base of the blister cover and defining front and rear surface-engaging edges for supporting the blister cover on a flat surface after it has been angularly deformed;

a flat strip of paper peelably joined to the blister cover so as to completely enclose the entire venipuncture device within the blister cover, said strip being peeled away from the handle portion of the blister cover and the handle restraining portion of the blister cover so as to partially expose the handle of the venipuncture device to finger access while at the same time maintaining the needle of the venipuncture device enclosed within the sterile needle portion of the blister cover, said handle of the venipuncture device being completely exposed to unobstructed finger access only after the blister cover has been angularly deformed; and

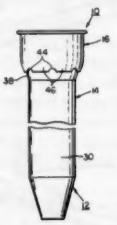
adhesive means disposed between the blister cover and strip of paper for peelably joining the blister cover to the paper, thereby forming a normally closed package for enclosing the entire venipuncture device until such time as the paper is peeled away from the handle portion and handle restraining portion of the blister cover so as to partially expose the handle of the venipuncture device in order to accommodate withdrawal of the device from the package.

4,106,622

TAMPER-RESISTANT RIGID SYRINGE PACKAGE AND METHOD OF MAKING THE SAME

Edward F. Windischman, Daytona Beach, Fla., assignor to Sherwood Medical Industries Inc., St. Louis, Mo.

Filed Aug. 1, 1977, Ser. No. 820,674
Int. Cl.[2] B65D *85/20*; A61M *5/00*
U.S. Cl. 206—365 **25 Claims**



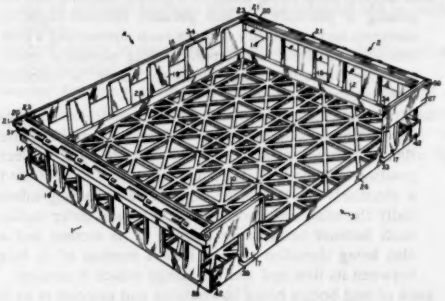
1. A rigid syringe package comprising a rigid sleeve member closed at one end and open at the other end, a syringe in said sleeve member having a barrel with a radial flange at the proximal end thereof, and piston means in said barrel, said sleeve member having a main body portion, an enlarged end portion at said other end having a greater diameter than said body portion, and a radially inwardly tapering connection portion connecting said enlarged end portion with said body portion, and a substantially rigid plastic closure member for closing said other end of said sleeve member, said closure member being closed at one end and open at the opposite end and including a generally cylindrical portion surrounding said enlarged end portion of said sleeve member, and a radially inwardly tapering end portion connected to said cylindrical portion at said opposite end and surrounding and engaging said tapering connection portion, said end portion of said closure member being sufficiently resilient to permit manual removal of said closure member from said sleeve member and having a diameter smaller than that of said enlarged end portion of said sleeve member to thereby resist the replacement thereof on said sleeve member.

4,106,623

THREE-LEVEL STACKING CONTAINER

James C. Carroll, Hopkinsville, Ky., and Lewis T. Johnson, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 15, 1977, Ser. No. 824,578
Int. Cl.[2] B65D *21/04, 21/06*
U.S. Cl. 206—506 **27 Claims**



1. A generally rectangular container adapted for stacking with another like container at three different levels comprising a generally horizontally disposed bottom, and first and second opposed sidewalls projecting upwardly from the opposing first and second sides of said bottom, respectively, with each of said first and second sidewalls comprising:

a border flange extending along the respective first or second opposite side of the bottom and being vertically disposed in a first vertical plane adjoining said respective side of said bottom,

an upper rim being vertically disposed above and in a second vertical plane outside and parallel to that of said first vertical plane,

a plurality of bar members extending vertically in a third vertical plane in an upwardly direction between the outer surface of said border flange and the inner surface of said upper rim, said bar members in one of said first and second opposed sidewalls being arranged with respect to the bar members and spacing thereof in the opposite of said first and second sidewalls so that another like container, when reversely oriented with respect to said container, will stack inside said container in a low stack position,

a plurality of spaced-apart stacking feet on the outer surface of the bottom flange,

a plurality of stacking saddles on the inner surface of said rim spaced above said stacking feet for registering in vertical alignment with said plurality of stacking feet of a like container placed upon said container in a like orientation so that the upper like oriented like container will stack inside said container in an intermediate stack position, said stacking feet and said stacking saddles being of such di-

mensions and so positioned as not to prohibit a like container from being placed in said container in said low stack position, and

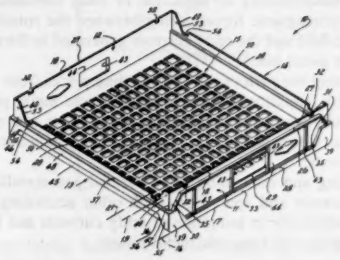
a pivotable bar means extending along and mounted to said rim, said bar means being capable of resting upon at least some of said stacking saddles inside said rim and being of such dimensions that when said bar means so rests upon said stacking saddles, another like oriented or reversely oriented like container will stack upon said bar means of said container in a high stack position, said bar means further being capable of being pivoted to a point which will allow a like container to be stacked in said container in either low stack or intermediate stack position.

4,106,624

TRAY STRUCTURE

Paul G. Thurman, West Liberty, Ohio, assignor to Dare Pafco, Inc., Urbana, Ohio

Filed May 19, 1977, Ser. No. 798,339
Int. Cl.[2] B65D *21/04*
U.S. Cl. 206—507 **18 Claims**



1. An improved square tray structure comprising

a pair of opposed end walls and a pair of opposed side walls, said end walls being of a height about one-half that of said side walls, and said end walls and side walls defining a tray structure of square configuration,

a floor, said end walls and said side walls all extending up from said tray's floor,

a top rail and a top rib extending along the top edge of each of said side walls, and a bottom rail extending along the bottom edge of each of said side walls, and

a middle rail and a middle rib extending along the top edge of each of said end walls,

the side walls of upper and lower trays being stackable one on another so that the upper tray's bottom rails seat on the lower tray's top ribs and rails on each side thereof for supporting said trays in stacked relation and for preventing side-to-side relative motion between said trays when in stacked relation, said stacked trays having a generally square cross section when in stacked relation with said square cross section being dimensionally the same as the square configuration for each tray in that stack, and

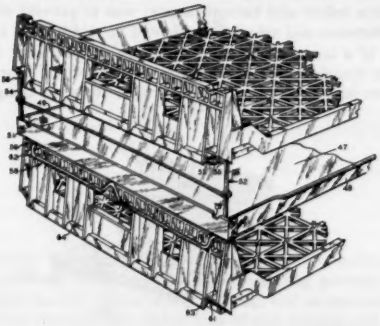
the upper and lower trays being nestable one on another in a position where the upper tray is rotated 90° relative to the lower tray from the stacked position so that the upper tray's bottom rails seat on the lower tray's middle ribs and rails, and so that the upper tray's middle rails seat on the lower tray's middle ribs and rails, and so that the upper tray's middle rails seat on the lower tray's upper ribs, for supporting said trays in nested relation and for preventing end-to-end motion between said trays when in nested relation, said nested trays having a generally square cross section when in nested relation with said square cross section being dimensionally the same as the square configuration for each tray in that nest.

4,106,625

MOLDED CONTAINER

James C. Carroll, Hopkinsville, Ky., and Lewis T. Johnson, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 18, 1977, Ser. No. 825,739
Int. Cl.[2] B65D *21/04*
U.S. Cl. 206—507 **4 Claims**



1. A unitary molded tray comprising:

a pair of vertical end walls, first and second side walls and a horizontal bottom connecting said end walls and said side walls;

a horizontal shoulder forming the upper edge of each of said end walls;

an elongated horizontal saddle formed on the lower portion of each of said end walls said elongated horizontal saddle terminating short of the ends of said end walls thereby providing recesses at each said end, said elongated horizontal shoulder and elongated horizontal saddle on each of said end walls being located in the same vertical plane whereby one said tray stacks on a second said tray when said one tray is placed above said second tray with said end walls of said one tray directly over said end walls of said second tray;

said side walls being horizontally longer and vertically shorter than said end walls and having horizontal support ledges on their upper surfaces whereby said one tray nests within said second tray and rests upon said ledges when oriented with its side walls parallel with the end walls of said second tray; and

a pair of transverse saddles formed in each of said horizontal shoulders whereby said one tray stacks on a third tray having a horizontal upper rod member having vertically upraised portions on each end thereof, said elongated horizontal saddle resting on said rod member with the upraised portions thereof within said recesses and said transverse saddles accept a pair of rod members extending at right angles to the ends of said third tray permitting said third tray to be stacked on said second tray.

4,106,626

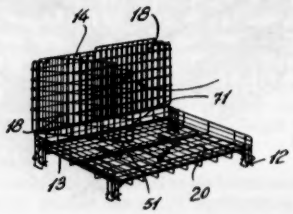
STACKABLE MATERIAL HANDLING CONTAINER

Antoine Trubiano, Pointe aux Trembles, Canada, assignor to Carl-All, Inc., Canada

Continuation of Ser. No. 735,510, Oct. 26, 1976, abandoned.
This application Aug. 22, 1977, Ser. No. 826,961
Int. Cl.[2] B65D *21/02, 7/24, 7/20*
U.S. Cl. 206—513 **14 Claims**

1. A stackable material handling container comprising a bottom support wall, opposed pairs of leg members on opposite sides of said bottom support wall, each of said leg members having a support surface spaced downwardly of said bottom support wall and an intermediate bearing surface spaced between said bottom support wall and said support surface, a

rigid upstanding wall secured to a marginal edge of said bottom support wall and extending thereabove across said pairs of leg members, guide means on a top edge of said upstanding wall to position said bearing surface of each of said leg members of a further container in a respective support edge section of said top edge whereby containers may be stacked in alignment one on top of the other, a collapsible side wall extending upwardly from a respective peripheral edge of said bottom support wall, said leg members extending a predetermined distance below said bottom support wall to prevent obstruction between said side walls collapsed on said bottom support wall of a container on which said leg members are resting when containers are stacked one on top of the other, said bottom support wall and said collapsible side walls being made



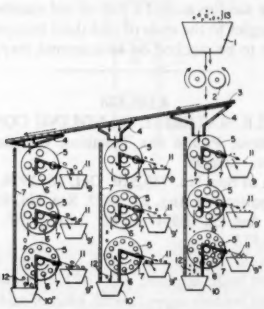
of structural wire members welded together, said leg members having two opposed spaced U-shaped members defining side arms and an interconnecting arm, said side arms being connected to said bottom support wall and said upstanding wall, a bottom portion of said side arms being angulated outward from each other, said interconnecting arm constituting said support surface, said side arms connected to said upstanding wall extending above a top edge of said upstanding wall and disposed angularly outwards in the plane of said upstanding wall to constitute a downwardly tapering groove having an open mouth substantially wider than the span of said support surface of said leg members to guide a respective one of said leg members so that said bearing surface will rest on said top edge between said side arms when folded containers are stacked one on top of the other.

4,106,627

METHOD AND APPARATUS FOR USE IN SEPARATION AND RECOVERY OF NON-MAGNETIC METAL PIECES

Ryuji Watanabe; Syöichi Sato, both of Ibaraki, and Sadami Tomita, Katsuta, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Jan. 21, 1976, Ser. No. 650,852
Claims priority, application Japan, Jan. 30, 1975, 50-11916
Int. Cl.[2] B03B *1/00*
U.S. Cl. 209—7 **20 Claims**



14. A method for separation and recovery of crushed non-magnetic metal pieces from a mixture of crushed non-magnetic metal pieces and crushed non-metallic pieces, comprising:

deforming at least said non-magnetic metal pieces among said mixed crushed pieces to a flattened shape of relatively small thickness;

screening the mixture that includes the flattened crushed non-magnetic metal pieces into a given size range of screened mixture;

receiving the screened mixture and freely dropping the screened mixture of crushed pieces including flattened nonmagnetic metal pieces through a separation space to fall freely by gravity;

producing a plurality of separate rotating magnetic fields vertically spaced from each other in said separation space so as produce different magnetic field characteristics in the vertical direction to induce corresponding eddy currents in said flattened non-magnetic metal pieces contained in the screened mixture of freely falling crushed pieces, and thereby first laterally deflecting the freely falling nonmagnetic metal pieces most susceptible to the induction of eddy currents therein from their freely falling path so that successive magnetic fields separate the non-magnetic metal pieces in order according to their decreasing susceptibility to induction of eddy currents, by the electromagnetic forces acting between the rotating magnetic field and the eddy currents generated in the nonmagnetic metal pieces;

separating the path of the freely falling prices from the path of the laterially deflected non-magnetic metal pieces, to thereby separate non-metallic pieces from non-magnetic metal pieces according to susceptibility of induced eddy currents;

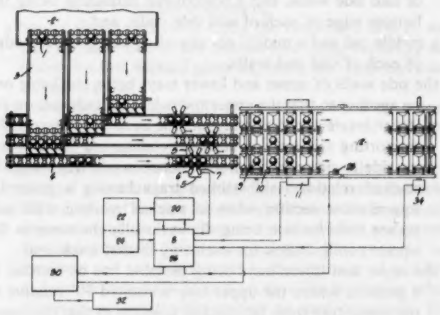
receiving and containing the separated non-metallic pieces separately and apart from each other according to their susceptibility to induction of eddy currents and from the separate non-magnetic metal pieces.

4,106,628

SORTER FOR FRUIT AND THE LIKE

Aaron J. Warkentin, 13551 View Dr., Orange Cove, Calif. 93646, and George A. Mills, 44 Kaweah River Dr., Three Rivers, Calif. 93271

Filed Feb. 20, 1976, Ser. No. 659,898
Int. Cl.[2] B07C *5/28, 5/342*
U.S. Cl. 209—74 M **18 Claims**



1. An automatic sorting apparatus comprising conveyance means for transporting a plurality of items to be sorted along a track and having individual cups for transporting each said item, said individual cups being connected in a continuous belt,

electronic weighing means incorporated into a portion of said track for generating a signal proportional to the weight of said item to be sorted,

reference signal means for providing a predetermined number of reference signals, the value of each signal established according to a predetermined criteria,

comparison means for comparing the signal generated by said electronic weighing means to the reference signals provided by said reference signal means,

clock means for incrementally signalling changes in position of an item to be sorted,

first position indicating means responsive to the signal from said clock means and the signal from said comparison means for generating a signal indicative of the position of the item to be sorted, and

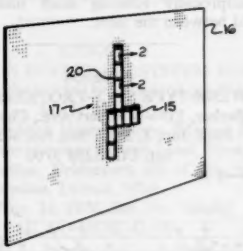
discharge means responsive to the signal generated by said position indicating means for discharging the item to be sorted at a predetermined position.

4,106,629

CAN DISPLAY HOLDER

Michael A. Doyle, 6917 Williams Dr., Perrysburg, Ohio 43551, and Paul E. Ekey, 115 Homestead Dr., Rossford, Ohio 43460

Filed Mar. 28, 1977, Ser. No. 781,534
Int. Cl.[2] A47F 5/00
U.S. Cl. 211—71 **13 Claims**



1. A can display holder for use in displaying cans on a pegboard or the like having a plurality of vertically and horizontally spaced holes, each of such cans having an upper lip, said can display holder comprising a base for supporting a can, means extending upwardly from said base for retaining a can on said base, arms extending from said base for engaging respective holes on such pegboard, means extending downwardly from said base for resisting downward rotation of the base, said resisting means including at least one rotation resisting member integrally mounted on said base and extending downwardly from said base for abutting such pegboard, and means extending downwardly for holding the lip of a can positioned immediately below said can display holder whereby said cans are displayed in vertical juxtaposition on said pegboard, said holding means comprising at least one holding member extending downwardly from said base spaced from and adjacent said resisting member wherein said holding member engages the interior surface of the upper lip of a can positioned immediately below said can display holder to prevent rotation of such can.

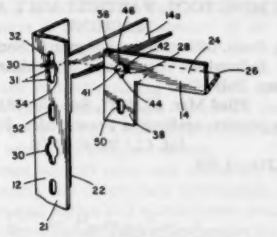
4,106,630

STORAGE RACK ASSEMBLY

Phillip Rosenband, Hammond, Ind., assignor to Parsteel Products Company, Inc., Chicago Heights, Ill.

Filed Apr. 28, 1977, Ser. No. 791,689
Int. Cl.[2] A47F 5/10
U.S. Cl. 211—191 **17 Claims**

1. In a storage rack assembly comprising at least one part of sheet metal or the like having at least one supporting wall with a front face and a back face, at least one opening in said supporting wall, at least one, one-piece beam of sheet metal or the like having an elongate wall portion with a front face and a back face and at least one load carrying tab struck from the wall portion adjacent one end of said beam and projecting from one face thereof, said tab being received in said opening with said beam extending transversely of said post, the improvement residing in said opening being wider in the central area thereof between opposite ends of said opening, which ends lie on a line which is co-axial with the elongate axis of said post, said tab having a central portion spaced outwardly from said one face of said wall portion and a connecting portion defined by two short arms which are integral with and extend, respectively, from opposite sides of said central portion to said wall portion and are integral with said wall portion, said central portion having at least one edge extending outwardly therefrom and transversely of said connecting portion and, when said beam is connected to said post, said central portion is received through said central area of said opening and then moved in a line co-axial with the elongate axis of said post to place one of said arms in one of said ends of said opening with said edge positioned over one face of said wall of said post.

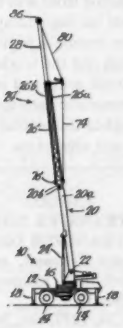


4,106,631

FLY AND JIB ASSEMBLY FOR CRANE

Richard W. Lundy, Rothschild, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed Feb. 18, 1977, Ser. No. 769,933
Int. Cl.[2] B66C 23/06
U.S. Cl. 212—144 **12 Claims**



1. A crane structure comprising a base, a main boom pivotally mounted on said base, a fly section secured to a free end of said main boom, said main boom having an opening adjacent the free end, and a jib section carried by an outer end of said fly section, means mounting said jib section for movement between a usable position in alignment with said fly section and a stored position below said fly section, said mounting means including link means having one end freely pivoted on said fly section and an opposite end pivotally supported on said jib section at a point spaced from a longitudinal center axis thereof, cable means for supporting said jib section, said cable means having one end connected to a free end of said jib section and a member on an opposite end receivable into said opening on said main boom so that the longitudinal axes for said fly section and said jib section are located on a common axis when said jib section is in an end-to-end usable position on said fly section, pivot means connecting said fly section to said

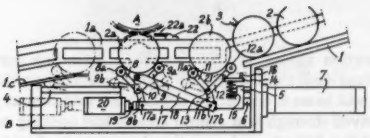
main boom to be fixed in a plurality of working positions one of which is in said end-to-end usable position and means preventing insertion of said member into said opening in said main boom when said fly section is in any position other than said end-to-end usable position.

4,106,632

DEVICE FOR AUTOMATICALLY LOADING A MACHINE TOOL, PARTICULARLY A SHAVING MACHINE

Oscar G. Bossi, Milan, Italy, assignor to Societe dite: Stabilimento Industriale Costruzione Macchinario Attrezzature, Pianezza, Italy

Filed Mar. 29, 1977, Ser. No. 782,457
Claims priority, application France, Mar. 31, 1976, 76 09348
Int. Cl.[2] B23F *19/06*
U.S. Cl. 214—1 BB **4 Claims**



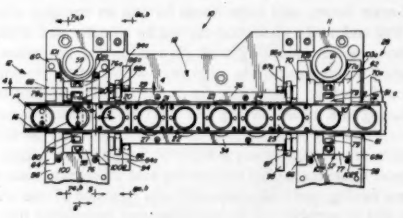
1. A device for automatically loading a machine tool, particularly a shaving machine, comprising on the one hand a chute conveying the workpieces, particularly gears, to a loading station, on the other hand an equipment whose support is mobile in translation along a rectilinear slide by means of a double-acting hydraulic or pneumatic ram, said slide extending at least between the loading station and the work station of the machine tool, whilst the mobile equipment comprises two units each comprising two arms, each unit of two arms being adapted to support a workpiece and the two arms of the front, unloading unit as well as the front arm of the rear, loading unit, being mounted to pivot on the sliding support, wherein the ends of the arms of the mobile equipment are provided with rotating rollers on which rest the workpieces, whilst a linkage connects the three pivotal arms and is coupled to a double-acting hydraulic or pneumatic ram mounted on said support and ensuring the passage of the pivotal arms from a high position to a low position and vice versa.

4,106,633

HIGH SPEED TRANSFER MECHANISM FOR TRANSFER DIE

Richard L. Lang, Mount Prospect, and Dietmar G. Quaas, Arlington Heights, both of Ill., assignors to Buhrke Industries, Inc., Arlington Heights, Ill.

Filed Feb. 24, 1977, Ser. No. 771,560
Int. Cl.[2] B65G *47/90*
U.S. Cl. 214—1 BB **10 Claims**



1. In a progressive die for use on a single-acting press having a punch plate mounting on its ram and die shoe mounting on its bed with die tooling stations erected thereon in linear array, the improvement in transfer mechanisms for holding workpieces during transfer for die forming the same comprising:

(a) shaft means mounting on said shoe for reciprocal rotational movement and having its axis parallel with and adjacent the tooling stations;

(b) first drive means operationally coordinated with the punch plate and engaging said shaft means for reciprocally rotating the same;

(c) bar means mounting on the shaft means between and in parallel relation with the axis thereof and the tooling stations for reciprocal translational movement and progressively transferring the workpieces from station to station in a direction parallel therewith;

(d) second drive means operationally coordinated with the punch plate and engaging the bar means for reciprocally translating the same;

(e) workpiece retaining means operationally mounting on said shaft means and progressively engaging the workpiece with said bar means during translation of the same; and

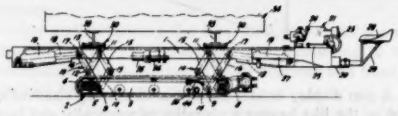
(f) means for reciprocally rotating said transfer bar means by said reciprocally rotating shaft means operationally mounted between the same.

4,106,634

CRAWLER-TYPE SELF-PROPELLED HOIST

Clifford E. Becker, 1196-B Filbert Ave., Chico, Calif. 95926

Filed Jun. 3, 1977, Ser. No. 803,238
Int. Cl.[2] B25J *3/00*
U.S. Cl. 214—1 D **6 Claims**



6. A hoist comprising a pair of elongated, power-driven, low-profile, endless track units disposed in adjacent but spaced parallel relation, said endless track units being interconnected in unitary relation, an elongated hoist beam disposed lengthwise between the endless track units, power-actuated supporting and lifting mechanism connected between the endless track units and the hoist beam, said power-actuated supporting and lifting mechanism including longitudinally spaced, foldable linkage assemblies of pantograph type and which when folded support the hoist beam in an initial lowered position substantially between the endless track units, the linkage assemblies when unfolded elevating said hoist beam from said initial lowered position to a raised position above the track units, and a corresponding longitudinal power cylinder mounted on the hoist beam and connected to each linkage assembly in unfolding and folding relation thereto.

4,106,635

ELEVATABLE DEPALLETIZING SYSTEM

Matsuo Nishimura, Tokyo, Japan, assignor to Yasui Sangyo Co., Ltd., Fujinomiya, Japan

Filed Feb. 17, 1977, Ser. No. 769,776
Int. Cl.[2] B65G *59/02*
U.S. Cl. 214—8.5 A **12 Claims**

1. A depalletizing system of the kind in which articles stacked up in layers on a pallet, each layer being composed of articles arranged in plural rows, are automatically depalletized, said system comprising;

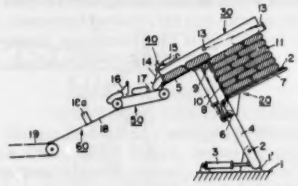
(a) hoisting means adapted to hoist up or down said palletized articles and tilt them at a required angle,

(b) a chute secured to the upper portion of said hoisting means substantially in parallel with the plane of each layer,

(c) control means adapted to stop the further upward move-

ment of the palletized articles when the lower surface of the uppermost layer has been located in alignment with or slightly above the plane of said chute,

(d) selecting means adapted to permit only the articles included in one of the plural rows to pass while blocking the passage of the articles in other rows, and



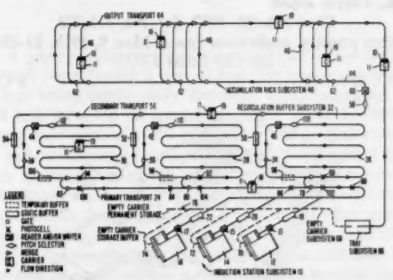
(e) separating means adapted to separate the articles issuing from said selecting means in order to put a suitable interval between the two adjacent articles.

4,106,636

RECIRCULATION BUFFER SUBSYSTEM FOR USE IN SORTING AND PROCESSING ARTICLES INCLUDING MAIL FLATS

Raymond Joseph Ouimet, Downingtown; Edward Arthur Wojtowicz, Bryn Mawr; George Edward Lund, Berwyn, and Ermenegildo Fiorentino, Bridgeport, all of Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed Nov. 24, 1976, Ser. No. 744,613
Int. Cl.[2] B65G *43/00*
U.S. Cl. 214—11 R **16 Claims**



1. A system for sorting and processing articles including flat mail pieces comprising in combination:

carriers coupled to said articles for providing support therefor and remaining therewith throughout the operation, escort memory means attached to each of said carriers and adapted to receive information regarding at least the destination of the article;

an induction station subsystem including write station means for storing a destination in the escort memory means of each of said carriers;

a recirculation buffer subsystem comprised of at least one recirculating buffer;

primary transport means for transporting said carriers from said induction station subsystem into said recirculating buffer, said last mentioned carriers having respective random destinations and being circulated continuously within said recirculating buffer;

control system means coupled to said induction station subsystem for establishing a destination queue encompassing all of the loaded carriers in the system, and in accordance with predetermined criteria, for selecting carriers associated with a particular destination to be outputted from the recirculating buffer;

read/write means situated within said recirculating buffer and so positioned with respect to the path of travel of said carriers as to read the destination of each carrier as contained in its escort memory;

an output accumulation rack subsystem having a plurality of individually identifiable output racks;

secondary transport means for transporting said carriers from said recirculation buffer subsystem to said output accumulation rack subsystem;

said read/write means within said recirculating buffer being coupled to said control system means and being directed thereby to store in the escort memory of the carriers selected to be outputted from the recirculating buffer, information identifying a particular output rack;

gate means within said recirculating buffer and operatively connected to said control system means for permitting said selected carriers to exit said recirculating buffer and to enter said secondary transport means;

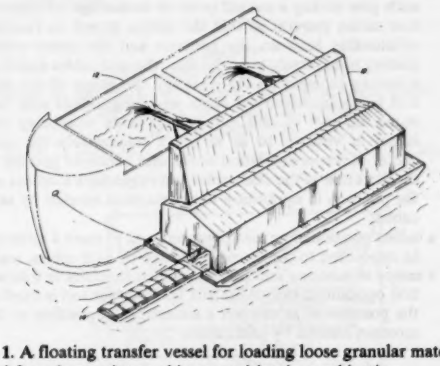
read station means situated along said secondary transport means for reading said output rack information, and gating means situated within said accumulation rack subsystem and responsive to said read station means for causing said selected carriers to enter and be stored in said particular output rack identified in its escort memory.

4,106,637

APPARATUS FOR AND METHOD OF LOADING LOOSE GRANULAR MATERIAL FROM BARGES INTO SHIPS

John Marsden, Kenner, La., assignor to Halter Marine Services, Inc., New Orleans, La.

Filed Mar. 30, 1977, Ser. No. 782,649
Int. Cl.[2] B65G *67/58*
U.S. Cl. 214—13 **3 Claims**



1. A floating transfer vessel for loading loose granular material from barges into a ship comprising in combination:

a. a docking platform integral with said transfer vessel for mooring a ship thereto;

b. a floodable barge passageway defined longitudinally in said transfer vessel along a side opposite to said docking platform for floating a string of loaded barges therein;

c. a closure mounted in an end of said passageway for the opening and closing thereof watertightly;

d. means for flooding and pumping out water, sufficient to float and to ground said barges in said barge passageway, mounted in said transfer vessel thereby making said transfer vessel and barges relatively movable and immovable in sequence; and

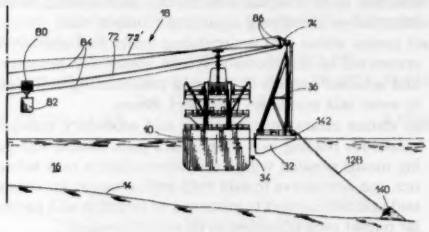
e. automated means, for digging and transferring granular materials from barge to ship, mounted in said transfer vessel and integral therewith and with said barges grounded in said barge passageway, said automated means being adjustable to closely follow the barge confines of said granular material without an allowance for relative movement between said transfer vessel and grounded barges.

4,106,638

SHIP AND SHORE LOAD HANDLING SYSTEM WITH AN ASYMMETRICAL SHAPED PONTOON FOR SUPPORTING CARRIAGE CABLES

Henri Negre, 8 & 10, rue Talma, 75016 Paris, and Jean-Pierre Cathiard, 38360 Noyarey, both of France

Filed Oct. 4, 1976, Ser. No. 728,958
Claims priority, application France, Oct. 13, 1975, 75 31333
Int. Cl.[2] B63B *27/00*; A01D *90/00*; B66C *21/00*
U.S. Cl. 214—14 **3 Claims**



1. An installation for the loading and unloading of a ship anchored in a zone near a shore, comprising:

a number of transporters each having an aerial cable and a first fixing point on the shore for the said cable,

an elongated floating pontoon moored in the said zone, in a position parallel to a ship, and having a partially submerged hull with a longitudinal axis, a center of gravity and a center of thrust on which is exerted Archimedes' thrust,

a number of piers carried and spaced along said pontoon, each pier having a second point of anchorage for respective cables thereon so that the cables stretch in parallel relationship between the pontoon and the shore while passing transversely over the ship, the said cables exerting a tipping moment on the pontoon, the shape of the said hull being asymmetrical about said longitudinal axis, the immersed part of said hull on the cable side being the larger in volume, so as to offset transversely the said center of thrust in relation to the said center of gravity in the direction of the said cables and engender a moment on the pontoon in opposition to the moment exerted by said cables,

a ballast positioned on said pontoon so as to exert a moment in opposition to the moment exerted by said cables, and

a means of mooring said pontoon which stretches in a direction opposite to that of the said aerial cables and is fixed to the pontoon so as to exert a moment in opposition to the moment exerted by said cables.

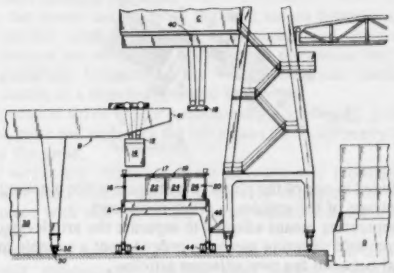
4,106,639

CONTAINER CONVEYOR APPARATUS AND METHOD FOR VESSEL LOADING CRANE-YARD INTERFACE

Murray Mathews Montgomery, Oakland; William Francis Gilger, Concord, and William Winfield Steiner, San Francisco, all of Calif., assignors to Matson Navigation Company, San Francisco, Calif.

Filed Dec. 13, 1976, Ser. No. 750,073
Int. Cl.[2] B65G *67/00*
U.S. Cl. 214—14 **20 Claims**

1. A process of conveying containers in the interface between a vessel loading crane and yard classification equipment comprising the steps of: providing a single file conveyance path having a first container work station underlying said vessel loading crane at one end of said path and a second container work station communicated to yard classification equipment at the other end of said path with at least one storage station between said first and second work stations for receiving at least one container; providing an underlying support along said single file conveyance path for the support of one or more containers on said work stations and said storage station; providing apparatus to convey containers deposited at one work station to the other said work station by lifting containers serially one at a time from below said support to a position above said support along said one-way conveyance path to convey containers between said work stations through said storage station whereby the spacing between said serially



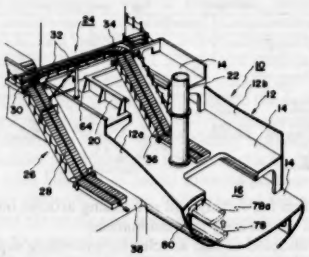
coveyed containers is variable; and, conveying said lifted containers serially between said work stations along and over said support to convey to said other work station any container on said path and conveying remaining containers on said path to a storage position juxtaposed to any container at said other work station to create a work bank of containers in conveyance between said work stations.

4,106,640

LOADING APPARATUS FOR CARGO VESSEL

Sadao Omote, Tokyo, Japan, assignor to Nissei Shipping Co., Ltd., Tokyo, Japan

Filed Feb. 23, 1977, Ser. No. 771,373
Claims priority, application Japan, Mar. 9, 1976, 51-25288
Int. Cl.[2] B63B *27/22*
U.S. Cl. 214—14 **6 Claims**



1. A loading apparatus for a cargo vessel, comprising conveyor means including a loading-in conveyor to load cargoes in the vessel, a first turning conveyor connected to an inlet end of said loading-in conveyor to turn said cargoes in a direction traverse to sasid vessel, a traversing conveyor connected to said first turning conveyor to convey said cargoes transversely of said vessel, a second turning conveyor connected to said traversing conveyor to turn said cargoes in a direction longitudinal of the vessel, and lowering conveyor connected to said second turning conveyor to convey said cargoes through a hatch in an uppermost deck to the bottom of an uppermost hold in said vessel; and conveyor switching means to move said first and second turning conveyors and said traversing conveyor transversely of said vessel between a first position in which one of said first and second turning conveyors projects from one of the sides of the vessel over a quay and a second position in which the other turning conveyor projects from the other side of the vessel over the quay; said loading-in and lowering conveyors being detachably mounted so that in said

first position, said loading-in conveyor is connected between the one turning conveyor and the quay in an inclined manner while the lowering conveyor is connectd between the other turning conveyor and the bottom of said uppermost hold in an inclined manner, and in said second position, said loading-in conveyor is connected between the other turning conveyor and the quay in an inclined manner while said lowering conveyor is connected between the one turning conveyor and the bottom of said uppermost hold in an inclined manner.

4,106,641

UNIVERSAL GANTRY CRANE

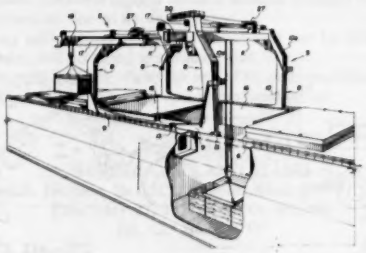
George Thomas Richardson Campbell; Toshishige Kasuga, and Kosaku Ohno, all of Tokyo, Japan, assignors to Algoship International Limited, Nassau, The Bahamas

Filed Jan. 3, 1977, Ser. No. 755,996

Claims priority, application Japan, Mar. 17, 1976, 51-028921; Apr. 9, 1976, 51-043834; Jun. 24, 1976, 51-074742; Aug. 24, 1976, 51-100793

Int. Cl.[2] B63B *27/12*

U.S. Cl. 214—15 R **18 Claims**



15. A gantry crane for travelling along rails on the deck of a ship, said crane having a pair of legs, the base portion of the said legs being horizontally disposed, a rail engaging drive wheel unit mounted on the end portions of the horizontally disposed base portion of the said legs, a bridge girder secured at its ends to the uppermost portion of the said pair of legs, a shuttle girder mounted for travel along one vertically outwardly facing surface of the said bridge girder for outreaching the ends of the bridge girder, a load hoisting trolley mounted for travel along a vertical outwardly facing surface of said shuttle girder remote from said bridge girder, said load hoisting trolley being located in a vertical plane intermediate the length of the base portion of the legs of the gantry crane, means to move said shuttle girder and said load hoisting trolley relative to each other and to said bridge girder, and means to operate said load hoisting trolley to raise and lower a load at any position of the load hoisting trolley with respect to the said shuttle girder and the said bridge girder, and means to locate and secure the gantry crane in a designated position on the rails on the deck of the ship on which the crane travels, said means to secure the gantry crane in a designated position including a pair of pedestals located immediately inwards on the deck surface on which the rails supporting the crane is laid, and a locking device on the inward facing surface of said legs of the crane engageable with securing means located on the top surface of said pedestals.

4,106,642

COKE PUSHING DEVICE

Harry Nicholas Hayduk, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Jul. 25, 1977, Ser. No. 818,392

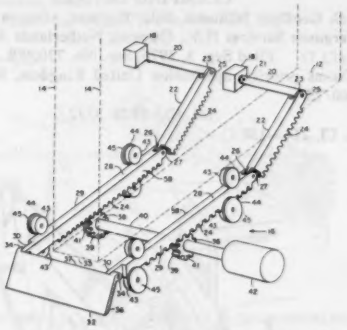
Int. Cl.[2] C10B *39/14*

U.S. Cl. 214—18 R **6 Claims**

1. In a horizontal coke oven battery, in combination with a coke guide and a coke guide car, means for spreading and leveling coke pushed from a coke oven through said coke guide into a one-spot coke quench car comprising:

(a) pusher means positioned adjacent the leading edge of the floor of said coke guide;

(b) projecting means by which said pusher means can be extended outwardly from said leading edge of said floor of said coke guide across the width of said one-spot coke quench car which has been positioned to receive said coke;



(c) pusher positioning means by which said pusher means can be diverted into said one-spot coke quench car to engage said coke therein; and

(d) retraction means by which said pusher means can be withdrawn from within said one-spot quench car and retracted toward said leading edge of said floor of said coke guide.

4,106,643

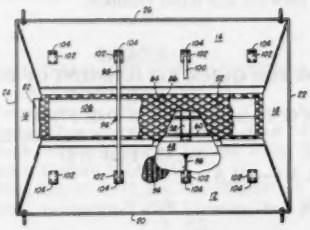
FERTILIZER SPREADER BOX

Wendyl B. McGehee, 309 Pawnee, Burns Flat, Okla. 73624

Filed Mar. 22, 1977, Ser. No. 780,023

Int. Cl.[2] B60P *1/38*

U.S. Cl. 214—83.36 **25 Claims**



1. A box for containing and spreading fertilizer comprising:

a hopper of inverted, frusto-conical configuration, said hopper including convergent, inwardly sloping side walls, and convergent, inwardly sloping end walls;

a plurality of saddle plates connected to the outer sides of each of said side walls and projecting downwardly therefrom;

a pair of tanks connected to lower end portions of said saddle plates and extending along the lower portion of said hopper along the outer sides thereof;

a plurality of horizontally spaced members extending transversely across and beneath said hopper and each having its opposite ends connected to said tanks;

a plurality of horizontally spaced, elongated rods extending longitudinally of, and beneath, said hopper and supported on said horizontally spaced members;

a bottom wall in said hopper and supported on said horizontally spaced, elongated rods; and

an endless belt conveyor including an upper run projecting over, and supported by, the bottom wall of said hopper, and including portions extending through openings at opposite ends of said hopper.

4,106,644

CLAMPING DEVICES

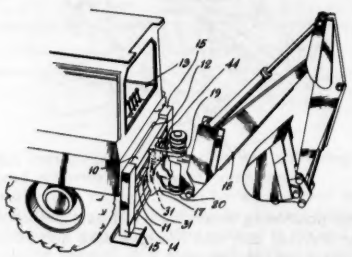
Derek Geoffrey Williams, Sale, England, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

Filed Sep. 3, 1976, Ser. No. 720,489

Claims priority, application United Kingdom, Sep. 3, 1975, 36360/75

Int. Cl.[2] E02F *3/32*

U.S. Cl. 214—138 C **30 Claims**



1. A backhoe assembly comprising a support frame arranged to be attached to a support, for example a vehicle, and including generally horizontal frame members spaced apart from each other, an intermediate frame mounted so as to be movable along the frame members and arranged to support a digging boom, the backhoe assembly further including a vertically-acting clamp for clamping the intermediate frame to one of the horizontal frame members and a horizontally-acting clamp for clamping the intermediate frame to another of the horizontal frame members, a housing integral with said intermediate frame, a roof portion of said housing for containing said vertically acting clamp against said one frame member, said roof portion extending outwardly from said intermediate frame and located between said frame members.

4,106,645

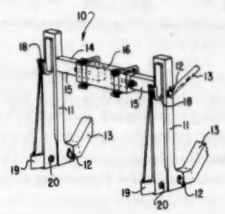
MEANS FOR QUICK ATTACHMENT OF IMPLEMENT TO A TRACTOR

Rudolph G. Janish, Parkston, S. Dak. 57366

Filed Jul. 18, 1977, Ser. No. 816,722

Int. Cl.[2] E02F *3/81*

U.S. Cl. 214—145 A **3 Claims**



1. A device for providing quick attachment of implements to a tractor comprising a framework adapted to be attached to said tractor, said framework including hook means at its upper part and guide means at its lower part, implement attaching means including spaced apart walls on an implement adapted to embrace said hook means and guide means, upper pin means extending between said walls engageable with said hooks, lower movable pin means extendable into holes formed in said guide means, spring means engaging said movable pin means to bias said pins toward a position fully inserted into said holes in the guide means, said movable pin means including pins and means on said pins adapted to hold said pins partly withdrawn, said quide means being formed in a V-shape whereby insertion of said guide means between said walls will cause engagement of said guide means with said pin to press the pin outward against said spring means until said pins are aligned with said holes in said guide means.

4,106,646

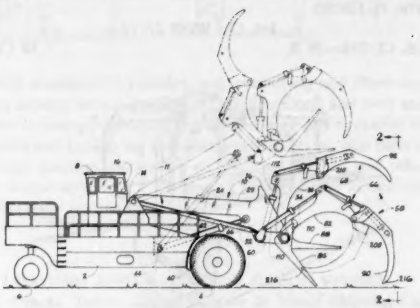
LOAD HANDLING VEHICLE

Charles E. Weisgerber, Portland, Oreg., assignor to Raygo Wagner, Inc., Portland, Oreg.

Filed May 17, 1976, Ser. No. 686,926

Int. Cl.[2] B66F *9/00*

U.S. Cl. 214—147 R **18 Claims**



13. A load carriage apparatus for connection to a load lifting member of a load handling vehicle comprising:

a pair of generally vertically disposed claw means each adapted to be pivoted independently of the other to the load lifting member at laterally spaced apart positions, each of said claw means defining a load receiving opening and comprising a main carriage means pivotally connected to the load lifting member for movement relative to said load lifting member and relative to the main carriage means of the other claw means in a generally vertical plane, fork means extending forwardly of a lower portion of said main carriage means for supporting the load within said opening, and tusk means pivotally connected to an upper portion of said main carriage means for movement between an open position to admit a load within said opening and a closed position to grasp a load within said opening;

means operable for pivoting each of said main carriage means relative to the other; and

tusk operating means for pivoting each of said tusk means in a generally vertical plane between said open and closed positions.

4,106,647

METHOD OF HANDLING BARS

Daniel Robert, Ully St. Georges, France, assignor to Societe de Constructions Mecaniques de Creil-COMEC, Creil, France

Filed Feb. 15, 1977, Ser. No. 768,747

Claims priority, application France, Apr. 2, 1976, 76 09628

Int. Cl.[2] B65G *7/00*

U.S. Cl. 214—152 **9 Claims**

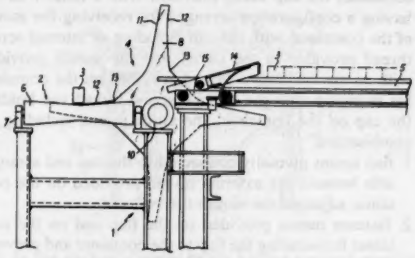
1. A method of disposing a bar having an outer envelope, as seen in cross-section, substantially rectangular shape, on one of its wider sides, the method comprising:

placing said bar on a first substantially cylindrical surface connected to a second substantially cylindrical surface

along a common generatrix such that the two tangential planes along this generatrix form a dihedral angle;

tilting said first surface to cause said bar to slide in the direction of said common generatrix until it abuts against the apex of said dihedral angle;

increasing the tilt so that said bar tips onto said second



surface if it is positioned on one of its narrower sides, or slides onto said second surface without tilting if it is positioned on one of its wider sides;

tilting said second surface to cause said bar to slide away from said common generatrix; and

collecting said bar with that one of its sides on which it has come to be positioned in a given orientation.

4,106,648

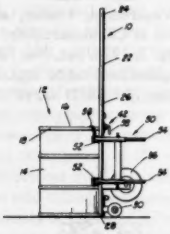
BARREL CART AND STAND

Richard E. Dickson, Box 517, Tribune, Kans. 67879

Filed May 27, 1977, Ser. No. 801,166

Int. Cl.[2] B62B *1/06*

U.S. Cl. 214—372 **5 Claims**



1. A barrel cart and a barrel stand for supporting a barrel thereon, the barrel having an annular rim around to top thereof, the cart and stand comprising:

a pair of elongated parallel barrel cart support members having an upper portion, a lower portion, and a center portion, the lower portion and the center portion receiving a side of the barrel thereon and therebetween, the upper portion used as cart handles;

a pair of first cart wheels mounted at the end of the lower portion of said support members and a pair of second cart wheels mounted on said support members and disposed adjacent the pair of said first cart wheels;

a barrel clamp attached to the center portion of said support members and disposed therebetween, said clamp engaging the annular rim of the barrel;

a concaved shaped barrel stand frame for receiving a portion of the side of the barrel thereon, said frame having outwardly extending legs in a spaced relationship for receiving said support members therebetween, and straps attached to said frame for suspending the barrel stand from the top of the barrel; and

the barrel stand suspended from the top of the barrel when the barrel is in an upright vertical position, the barrel cart received between said legs of the barrel stand and secured to the barrel by said barrel clamp with said barrel stand frame disposed therebetween.

4,106,649

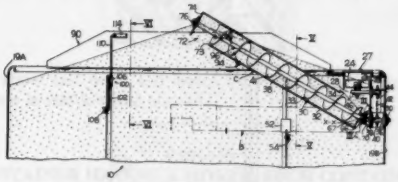
FLOATING GRAIN BIN EXTENSION FOR USE WITH AGRICULTURAL COMBINE

John P. Nelson, Independence, and Roger D. Hanaway, Blue Springs, both of Mo., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Aug. 22, 1977, Ser. No. 826,751

Int. Cl.[2] B60P *1/42*

U.S. Cl. 214—522 **17 Claims**



1. In combination, a grain bin adapted to be mounted on an agricultural combine, a bin loading conveyor positioned in the upper portion of said grain bin, means for delivering grain to said bin loading conveyor, said bin loading conveyor being adapted to receive grain and to convey grain which it receives to a discharge outlet of said bin loading conveyor in overlying relation to the interior of said grain bin, support means supporting said bin loading conveyor for pivotal movement about a horizontal axis whereby said bin loading conveyor swings vertically upwardly or downwardly about said horizontal axis in accordance with the level of grain in said bin after the grain in said bin reaches a predetermined level, at least one bin wall extension for increasing the height of said bin in the region of said bin wall extension, said bin wall extension being normally positioned in a lowered position, and means connecting said bin wall extension to said bin loading conveyor whereby said bin wall extension is selectively moved upwardly to a raised grain-retaining position or is moved downwardly to said lowered position in accordance with the vertical movement of said bin loading conveyor.

4,106,650

ARTICULATED MEMBER FOR HANDLING AND CONTROLLING LOADS

Christopher Edward James Blackstone, The Close, Minchinhampton Stroud, Gloucestershire, England (GL6 9JE), and Geoffrey Hugh Williams, Cogan, Talboys Walk, Tetbury, Gloucestershire, England (GL8 8YU)

Filed Jan. 10, 1977, Ser. No. 757,833

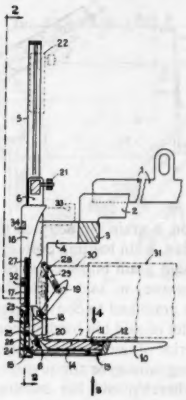
Claims priority, application United Kingdom, Jan. 20, 1976, 02061/76

Int. Cl.[2] B65G *67/00*

U.S. Cl. 214—750 **6 Claims**

1. Improvements in load handling equipment of a kind comprising in combination: a lifting frame, a set of legs, means of fixing said legs to said frame, a set of guides, means of fixing said guides to said legs, a set of stirrup members, each said stirrup member being slideably connected to a pair of said guides, a set of root fork members, each said root fork member being pivotally connected to one said stirrup member, a set of tip fork members, each said tip fork member being pivotally connected to one associated root fork member, a set of back plates, means of fixing one said back plate to an adjacent pair of said legs, each said back plate is characterized by a shaped part of one edge, the said root fork member is characterized by a hook shaped extension, when the said root fork member is in an extended position the said hook shaped extension thereon abuts the said shaped part of the said back plate that is associ-

ated with that particular root fork member, said abutting contact being defined as the first root abutting contact, in addition a second root abutting contact is made between the said root member and the said associated back plate, said second root abutting contact is in an area removed from the area of the said first root abutting contact, each said root fork member is further characterized by the provision at an extremity, remote from the said back plate when in the extended position, of tooth shaped extensions and a joint abutting face removed from the area of said tooth shaped extensions, each said tip fork member is characterized by a set of tooth shaped extensions and a joint abutting face that match said tooth shaped extensions and joint abutting face of the said associated and said



pivotally connected root fork member, when both said root fork member and said associated tip fork member are in the extended position both sets of said tooth shaped extensions are in contact and both said joint abutting faces are in contact, such conjunction of both said tooth shaped extensions and both said abutting faces provide a strong and stiff joint between said tip fork member and said associated root fork member, when said tip fork member and said associated root fork member are displaced from the extended position the accompanying relative rotation, between the said tip fork member and said associated root fork member, about the said pivotal connection causes both the said associated pair of tooth shaped extensions and said associated pair of joint abutting faces to move freely out of engagement.

4,106,651

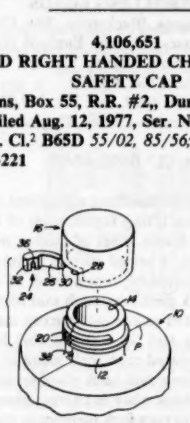
LEFT AND RIGHT HANDED CHILD-RESISTANT SAFETY CAP

John B. Lemons, Box 55, R.R. #2,, Dunkirk, Ind. 47336

Filed Aug. 12, 1977, Ser. No. 824,327

Int. Cl.[2] B65D *55/02, 85/56;* **A61J** *1/00*

U.S. Cl. 215—221 **8 Claims**



1. A safety closure structure for containers, comprising, in combination:

a. a hollow container having a mouth forming an access opening into the container;

b. a cap removably mountable on the mouth of the container for blocking the access opening; and

c. lock means provided on the cap and the container for preventing removal of the cap from the mouth of the container, the cap being provided with a hollow cavity having a configuration arranged for receiving the mouth of the container, with the cap including an internal screw thread provided in the cavity and the mouth provided with an external screw thread provided on the container for engaging with the internal screw thread and holding the cap on the container, the clock means including, in combination:

1. flap means pivotally connected to the cap and arrangeable beneath the external thread provided on the container adjacent the mouth thereof; and

2. fastener means provided on the flap and on the container for securing the flap to the container and preventing the cap from rotation relative to the container, the cap having a side wall partially forming the cavity and an opening communicating with the cavity, and a cut out being provided in the side wall of the cap adjacent the opening therein and arranged for receiving the flap, the latter extending between a pair of spaced, substantially parallel edges, the flap being pivotally connected to the cap at one of the edges, and a portion of the fastener means being provided on the flap adjacent the other of the edges of the flap.

4,106,652

AMPOULE

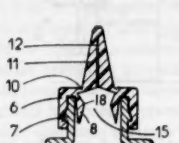
Jacques Leclabart, Vaucresson, France, assignor to Societe Anonyme Parfumerie et Chimieparchimy, Reims, France

Filed Sep. 7, 1976, Ser. No. 720,771

Claims priority, application France Sept. 11, 1975, 7527830

Int. Cl.[2] B65D *41/46*

U.S. Cl. 215—253 **5 Claims**



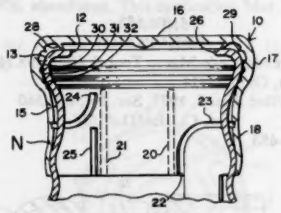
1. An ampoule for containing a liquid product and able to be filled under vacuum, said ampoule comprising a container body having a neck with an opening and a stopper of plastic material force-fitted on said body to close said opening, said stopper having a weakened zone enabling a portion of said stopper to be easily torn away to open an orifice of sufficient area to allow the product contained in said ampoule to run out normally, said stopper defining a capillary vacuum-filling orifice to be closed after filling, said stopper including a projecting nose which constitutes said portion of said stopper which is torn away, said nose being of conical shape and having a tearable base, the portion of said ampoule which remains in place after tearing off said nose including an internal collar included in the neck of the container with a central opening of smaller diameter than said base of said nose so that said nose, after removal and reversal, is introducible into said opening to re-stopper said ampoule.

4,106,653

TEARABLE BOTTLE CAP

Luciano B. Martinelli, 418 Sevilla, Coral Gables, Fla. 33134

Filed Jun. 13, 1977, Ser. No. 806,079
Int. Cl.[2] B65D *41/48*
U.S. Cl. 215—256 1 Claim



1. In the neck of a water bottle having a mouth portion, an upper and a lower bead and a neck portion of reduced diameter joining said upper and lower beads and a lip portion, a tearable plastic cap comprising a disk portion extending across the mouth of said neck portion having an inwardly extending peripheral finger portion engaging said lip portion, an external bead portion engaging said upper bead and a skirt portion extending downwardly from said external bead portion, across said neck portion of reduced diameter and engaging said lower bead, said external bead portion having a plurality of peripheral ridge portions on the inner surface thereof in water-tight relation with said upper bead, said peripheral ridge portions being of decreasing cross sectional areas engaging said upper bead from the upper to the lower portions thereof, a pair of spaced apart reinforcement members extending downwardly on the outer surface of said skirt portion from said external bead portion, a tab portion extending downwardly from said skirt portion, and a plurality of score lines formed along the inner surface of said skirt portion for the removal of said tab portion and said skirt portion, one of said score lines commencing at the lower portion of said skirt portion between said tab portion and one of said reinforcement members, extending upwardly to a position below said external bead, peripherally about said skirt and terminating at the upper portion of the other of said reinforcement members and a second score line extending alongside said other of said reinforcement members and terminatin proximity of the terminal end of said one of said score lines whereby upon grasping said tab portion and tearing said skirt along said score lines said tab and a portion of said skirt become separated from said cap and said cap becoming removable from said water bottle and that portion of said skirt portion between said reinforcement members becoming a second tab to permit reuse of said cap.

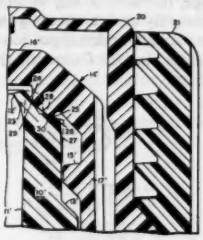
4,106,654

CONTAINER WITH SIDE SEALING CLOSURE AND METHOD OF FORMING THE SEAL THEREOF

Eugene C. Jones, Laguna Niguel, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Mar. 10, 1977, Ser. No. 776,436
Int. Cl.[2] B65D *41/04*
U.S. Cl. 215—329 16 Claims

1. In combination, a flexible plastic container having an upstanding neck portion terminating in an annular lip defining a discharge opening; said lip having an upwardly and inwardly tapering side surface; a closure for said opening having a top wall, an annular side wall, and an internal shoulder sealingly engagable with said tapered surface to flex said lip inwardly when said closure is forced downwardly into a lowered position about said neck; and means for releasably holding said closure in said lowered position.

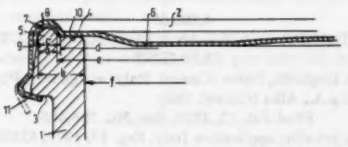


4,106,655

CONTAINER HAVING A MOUTH, SUCH CONTAINER PROVIDED WITH A METAL CAP AND METAL CAP FOR CLOSING SUCH CONTAINER

Hendrik Gerrit Heijting, Deventer, Netherlands, assignor to Thomassen en Drijver-Verblifa N.V., Deventer, Netherlands

Filed Sep. 16, 1976, Ser. No. 724,078
Claims priority, application Netherlands, Sep. 17, 1975, 7503162
Int. Cl.[2] B65D *53/00*
U.S. Cl. 214—341 9 Claims



1. A combination of a container and a closure cap; said container having a mouth internally defined by a substantially planar upwardly facing seating surface; an upstanding rim dispersed radially outwardly and axially upwardly of said seating surface, and cap retaining abutment means spaced axially downwardly from said rim; said closure cap having a central panel, downwardly opening a sealing channel surrounding said central panel, a skirt extending down from said sealing channel, said sealing channel having a deformable sealing material therein, and said skirt having retaining means; and said closure cap being seated on said container in mouth sealing relation with said retaining means engaging said abutment means and urging said sealing channel down over said rim with said sealing material being deformed around said rim and deformation of said sealing material being limited by the seating of said central panel on said seating surface.

4,106,656

COMPOSITE STOPPER

Pierre Babiol, Villefranche-sur-Saone, France, assignor to Societe Nouvelle de Bouchons Plastiques, S.N.B.P., Paris, France

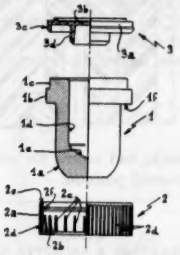
Filed Oct. 14, 1976, Ser. No. 732,222
Claims priority, application France, Oct. 20, 1975, 75 32390
Int. Cl.[2] B65D *39/00*
U.S. Cl. 215—364 4 Claims

1. A composite stopper comprising:

a body made of resilient deformable plastic material, the body having a cylindrical portion and having a central blind recess extending axially downwardly thereinto, and the body having an annular flange of diameter greater

than the cylindrical portion extending around the cylindrical portion opposite said blind recess;

a cage member comprising a tubular skirt of diameter fitting over said flange, the skirt having an annular ring extending radially inwardly and terminating in an axial bore of diameter fitting said cylindrical portion of the body, the annular ring underlying the flange and the skirt extending up the flange; and



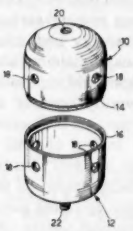
a disc-like member having a downwardly extending peripheral rim shaped to axially enter said skirt and overlie said resilient body, and the member having a downwardly extending axially disposed sleeve of diameter larger than said blind recess, the sleeve being force fitted within the body when the rim of the disc-like member is entered in the skirt and expanding the body into tight engagement with said skirt.

4,106,657

CONTAINER USABLE AS A TOY CONSTRUCTION ELEMENT

Amilcare Dogliotti, Neive (Cuneo), Italy, assignor to P. Ferrero & C. S.p.A., Alba (Cuneo), Italy

Filed Jul. 19, 1976, Ser. No. 706,406
Claims priority, application Italy, Sep. 17, 1975, 53338/75[U]
Int. Cl.[2] B65D *21/02;* A63H *33/08*
U.S. Cl. 220—23.4 **1 Claim**



1. A container for gifts, suitable to be used as a toy construction element, said container comprising:

first and second substantially equal size cup-shaped parts,

means on said first and second parts permitting snap engagement of said parts together at their rims in such a manner as to form a container in the form of a generally ovoid barrel having a smooth hollow interior,

means defining a plurality of holes in the side wall of the first of said cup-shaped parts spaced from the rim of said first part and lying in a common plane parallel to said rim,

means defining a hole in the bottom of said first of said cup-shaped parts,

means defining a plurality of holes in the side wall of the second of said cup-shaped parts spaced from the rim of the second part and lying in a common place parallel to said rim, and

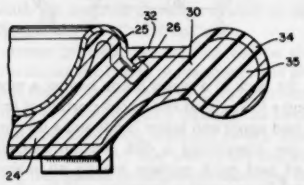
a mushroom headed projection extending outwardly from the bottom of the second of said cup-shaped parts, said mushroom headed projection being snap engageable with any of the holes in the side walls or the bottom of the first or second parts of another like container.

4,106,658

PLATTER

Richard N. Brandon, c/o Marco Tool & Die 6868 Homestretch Rd., Dayton, Ohio 45414

Filed Jun. 6, 1977, Ser. No. 803,560
Int. Cl.[2] B65D *25/14*
U.S. Cl. 220—453 **5 Claims**



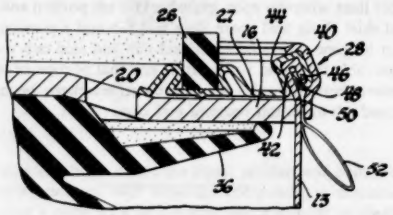
5. A heat retaining unitary serving platter comprising a sheet metal tray having a raised margin terminating in a peripherally downwardly turned edge, a rigid heat insulating plastic molded base in conforming underlying relation to the bottom surface of said tray with a peripheral rim extending outwardly of said raised portion, said edge being continuously embedded into said base inwardly of said rim encapsulating and locking said tray and said base together in a unitary construction.

4,106,659

PRESSURE VESSEL

Richard G. Dent, Davison, and Gary F. Stack, Holly, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 1, 1976, Ser. No. 701,527
Int. Cl.[2] B65D *7/42, 45/32*
U.S. Cl. 220—67 **2 Claims**



1. A pressure vessel comprising a sheet-metal canister having an open end, a rigid plate having an outer edge conforming to and fitting within said open end, a sheetmetal lid juxtaposed with an outer portion of said plate, said canister at said open end and an outer portion of said lid being folded together to form a lockseam having pleats extending longitudinally of said canister and overhanging said plate, and a continuous band fitting over said lockseam and also said plate and forcing said lockseam to be bent radially inward about said plate so that said pleats are oriented transversely of the canister whereby the forces acting to pull the lockseam apart must also bend said lockseam outward about said plate and against said band before the lockseam can unravel.

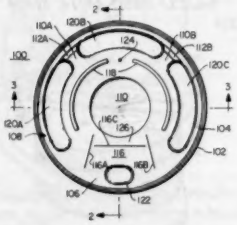
4,106,660
SPLASH PROOF DRINK-THROUGH BEVERAGE CONTAINER LID

Patrick T. Boyle, Baltimore, Md., assignor to Maryland Cup Corporation, Owings Mills, Md.

Continuation-in-part of Ser. No. 722,402, Sep. 13, 1976, Pat. No. 4,056,210, which is a continuation-in-part of Ser. No. 678,751, Apr. 21, 1976, abandoned. This application Mar. 14, 1977, Ser. No. 777,141

Int. Cl.[2] **A47G** *19/22;* **B65D** *7/24, 41/32*

U.S. Cl. 220—90.4 **28 Claims**



1. A friction fit sheet plastic lid for open mouthed containers having a peripheral lid receiving rim portion about the mouth thereof comprising:

a peripheral rim receiving cavity defined therein;

a central web bounded by said rim cavity;

a raised area formed in said central web;

an upper surface on said rim cavity at substantially the same height as said raised area and merging therewith over at least a predetermined peripheral portion; and

a wedge shaped tear-away section having a tear-tab at its innermost extremity defined by score lines which diverge to substantially subtend said predetermined peripheral portion and which terminate substantially inboard of said upper surface of said bead cavity;

said tear-away section and said predetermined peripheral portion being removable from the remainder of said lid by an upward and outward force on said tear-tab;

said rim cavity being interrupted internally of said lid over said predetermined peripheral portion; and

said tear-away segment including a substantially steepwalled cavity defined therein adjacent said rim cavity and having an outer wall cooperating with the outermost portion of the interrupter portion of said rim cavity to define a segmental rim gripping means for replaceably securing said tear-away section on the rim of an associated container.

4,106,661
INFLATABLY SEALED STERILIZER DOOR

Robert E. Hunt, Andover, Mass., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation of Ser. No. 647,238, Jan. 7, 1976, abandoned. This application Mar. 3, 1977, Ser. No. 774,166

Int. Cl.[2] **B65D** *53/00, 45/00*

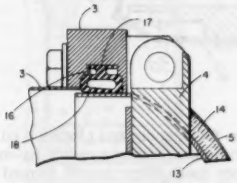
U.S. Cl. 220—232 **1 Claim**

1. An apparatus for sealing a container comprising:

a. locking means having a track guide connected to the container, a bolt having tapered and untapered ends located in said track guide, a handle connected to the untapered end of said bolt, said track guide slotted for communication therethrough of said handle, and a receiving chamber connected to said container for receiving the tapered end of said bolt when said bolt is in the closed condition;

b. interlock means connected to said receiving chamber having a bar lever with first and second ends, said interlock means having a pin having one end located in and perpendicular to said receiving chamber and the other end connected to the first end of said bar lever, the second end of said bar lever hingedly affixed to said container and a circuit breaker button connected to the center of said bar lever;

c. a cover disposed over the mouth of the container, said cover having an inner rigid surface, a supportive member attached to said inner rigid surface having a hole therein positioned for communication with said bolt when said cover is in the closed condition, an outer rigid surface located parallel to said inner surface and removably affixed thereto, and insulating material located between said inner and outer materials;



d. a rigid flange affixed to the inside of said cover and positioned parallel and adjacent to the inner surface of the mouth of the container;

e. an inflatable seal carried in a recess in the inner surface of the mouth of the container, said inflatable seal when inflated making airtight contact with said flange and the inner surface of the mouth of the container causing a force in a direction perpendicular to said flange and the inside of the container; and

f. a hinge connecting said cover to said container whereby a frictional force is created which prevents the opening of said cover.

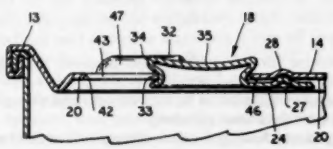
4,106,662
EASY-OPEN CONTAINER WITH FLANGE PUSH-IN MEMBER

Carl J. Strobe, 2831 Orchard Knob, and Robert A. Wells, 4450 Harris Trail, N.W., both of Atlanta, Ga. 30327

Division of Ser. No. 580,624, May 27, 1975, Pat. No. 4,023,703. This application May 13, 1977, Ser. No. 796,510

Int. Cl.[2] **B65D** *41/32*

U.S. Cl. 220—268 **14 Claims**



1. Easy opening container wall apparatus having unitary opening structure, comprising:

a wall having an outer side and an inner side;

an openable member defined in said wall by a selectably separable region of weakness;

an opening tab integrally formed with said openable member and extending a distance above said outer side, said opening tab having a portion which overhangs at least a portion of said separable region; and

said opening tab being formed in said openable member so that said opening tab is a unitary portion of said openable member.

4,106,663

MEANS FOR OPENING AND CLOSING A LID OF CASSETTE TAPE RECEIVER PORTION

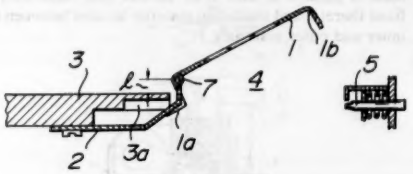
Toshihiro Nakao, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 9, 1977, Ser. No. 805,171

Claims priority, application Japan, Jun. 11, 1976, 51-76136[U]

Int. Cl.[2] B65D *45/16*

U.S. Cl. 220—326 **5 Claims**



1. A means for opening and closing a lid on a cassette tape receiver portion comprising a casing having an opening portion, a lid body having a projection formed at a side end to be rotated for opening and closing the opening portion of the casing, a spring plate for rotatably supporting the lid body through a hinge connection and having a mandrel and being directed downwards and its free end portion being bent upwards against the side end fixed in the casing, and an abutment provided in the casing for engaging the projection of the lid body when closing the lid body, whereby the hinge connection is positioned above the surface of the casing by a predetermined amount when the lid body is opened.

4,106,664

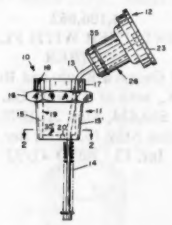
CLOSURE

Richard John Renk, and George Earl Boller, both of Winona, Minn., assignors to Gladys D. Miller, Winona, Minn.

Filed Jun. 4, 1976, Ser. No. 693,091

Int. Cl.[2] B65D *43/14*

U.S. Cl. 220—329 **13 Claims**



1. A closure for use with a base member having a bore therein defined by a wall area comprising,

a top member adapted to be moved into and out of engagement with said base member,

securing means having a relatively smooth area operatively connecting said top member to said base member, said securing means being pliant so as to be able to somewhat conform to said bore,

guide means carried by one of said members for slideably engaging said securing means along said smooth area and keeping at least a portion of the securing means in a predetermined alignment with respect to its associated member while allowing other portions of said securing means to be moved toward a different area of said base member to provide a relatively unobstructed bore, and

biasing means operatively connected to said securing means to urge said top member into restrictive engagement with said base member,

said top member being capable of being moved away from said base member to provide a generally unobstructed filling opening and being moveable into engagement with said base member under the action of said biasing means which causes said securing means to slide past said guide means and urge said top member into engagement with said base member.

4,106,665

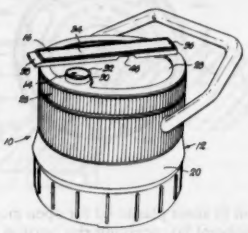
CONTAINER CLOSURE

John Porter Cannon, Overland Park, Kans., assignor to Plattner Industries, Inc., Ottawa, Kans.

Filed May 9, 1977, Ser. No. 794,746

Int. Cl.[2] B65D *43/14, 51/04*

U.S. Cl. 220—329 **6 Claims**



1. A container including:

a generally cylindrical hollow body provided with a circular substantially flat top wall presenting an arcuate periphery;

an outlet in said wall adjacent said periphery;

a closure for said outlet,

said closure including an elongate arm having a pair of opposed ends each presenting an arcuate terminal edge,

said terminal edges having a curvature substantially identical to the curvature of said periphery,

said arm being normally disposed in a first position overlying said outlet and fully traversing said wall diametrically,

said edges being aligned with opposed segments of said arcuate periphery when said arm is in said first position,

a mount at one end of said arm releasably, pivotally attaching the latter to the wall adjacent said periphery for swinging movement to and from said position within a plane generally parallel with the wall; and

releasable means at the opposite end of said arm holding the latter in closing relationship to the outlet when the arm is in said position,

said arm being resilient rendering the same capable of being flexed away from said outlet to a second position releasing the arm from the latter prior to swinging the arm about said mount away from the outlet,

at least a portion of each of said edges extending beyond said periphery when said arm is swung about said mount away from said outlet, whereby to provide convenient manual engagement of the arm for return of the latter to said first position or for releasing said arm from said mount.

4,106,666

FLUID RESERVOIR

Takayoshi Ono, Toyota, Japan, assignor to Toyota Tidoshakogyo Kabushiki Kaisha, Japan

Filed Mar. 3, 1976, Ser. No. 663,344

Claims priority, application Japan, Mar. 14, 1975, 50-35073[U]

Int. Cl.[2] B65D *51/16, 53/00*

U.S. Cl. 220—373 **6 Claims**

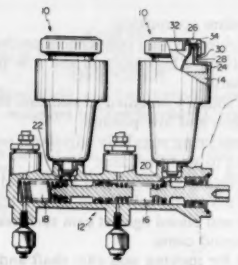
1. A fluid reservoir for brake or clutch master cylinders in motor vehicles, comprising:

a fluid reservoir body;

a cap attached to an inlet opening portion of said reservoir body by threaded engaging means;

a rubber sealing member interposed between an inside face of said cap and an end face of said inlet opening portion of the reservoir body; and

a spacer means composed of material other than rubber, such as metal or resins, disposed between said inside face of the



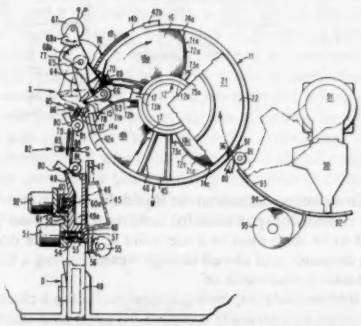
cap and said sealing member so that the cap does not solidly adhere to the reservoir body, wherein said cap has an annular sleeve extending from the inside face of the cap and at least one air breathing port, which is formed in said cap between said sleeve and the abutting portion between said spacer means and said inside face of the cap.

4,106,667

APPARATUS AND METHOD FOR CONDUCTING FINANCIAL TRANSACTIONS

John Joseph Lynott, Los Gatos, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 20, 1976, Ser. No. 752,503
Int. Cl.[2] G07F *11/00*
U.S. Cl. 221—1 **17 Claims**



1. For use in an apparatus for conducting financial transactions, a cartridge comprising:

two concentric members, the outer having an opening through which currency can be dispensed, and the inner providing a plurality of compartments for storing currency of differing denominations;

one of said members adapted to be rotatable relative to the other member to align a selected compartment with the opening preparatory to a currency dispensing operation;

a plurality of circumferentially spaced fixed stop elements projecting radially from a central core of said inner member; and

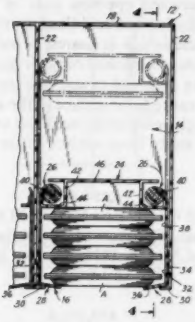
a plurality of compacting elements disposed between said stop elements and freely rotatable about said core, said elements being flexible and frictionally engaging the inner surface of said outer member to automatically compact the currency within the respective compartments upon rotation of said inner member relative to said outer member.

4,106,668

DEVICE FOR DISPLAYING AND STORING ARTICLES

Roland Gebhardt, and Robert P. Gersin, both of New York, N.Y., assignors to Kayser-Roth Corporation, New York, N.Y.

Filed Feb. 14, 1977, Ser. No. 768,259
Int. Cl.[2] B65G *59/00*
U.S. Cl. 221—131 **9 Claims**



1. A device for storing and displaying articles, comprising wall means defining at least one chamber which has at least one open end and which is adapted to receive in its interior a plurality of articles arranged one behind the other with one of said articles nearer to said open end of said chamber than the other articles, pusher means situated in said chamber in alignment with said open end thereof for engaging that one of the articles which is most distant from said open end of said chamber and for pushing the articles toward said open end of said chamber, spring means engaging said pusher means for urging the latter toward said open end of said chamber so that said spring means and pusher means cooperate to urge the articles out of the chamber through said open end thereof, and retainer means carried by said wall means at the region of said open end of said chamber for retaining the articles in said chamber in opposition to the force of said pusher means with the article nearest to the open end of said chamber being held by said retainer means against movement out of said chamber until the latter article is withdrawn from the chamber, whereupon said pusher means is acted upon by said spring means to advance the articles toward said open end of said chamber until the next article initially situated behind the article withdrawn from the open end of the chamber becomes situated at the location previously occupied by the withdrawn article, said wall means which defines said chamber including a pair of opposed wall portions extending longitudinally along said chamber and terminating at said open end thereof, and said retainer means including at least as a part thereof a pair of flanges fixed to said pair of opposed wall portions where they terminate at said open end of said chamber, said flanges extending inwardly toward each other from said pair of opposed wall portions to provide for said open end of said chamber between said flanges a dimension smaller than the distance between said pair of opposed wall portions, said retainer means further including only one pair of yieldable springy members respectively fixed to said opposed wall portions at inner surfaces thereof which are directed toward each other and respectively having free end portions extending inwardly toward each other from said opposed wall portions and situated adjacent but behind said flanges, said free end portions of said springy members extending inwardly beyond said flanges for directly engaging an article which is nearest to said open end of said chamber as well for being urged into engagement with said flanges so that said free end portions of said springy members together with

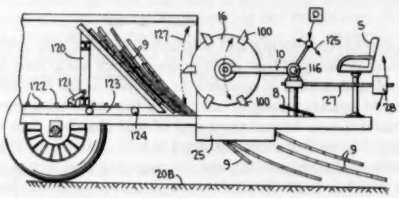
said flanges form the retainer means which releasably retains in said chamber the row of articles with one of the latter articles situated at the region of said open end of said chamber, said flanges extending substantially along the entire length of end edges, respectively, of said opposed wall portions where they terminate at said open end of said chamber, and said flanges being relatively narrow and having a width sufficiently small to provide for a substantially full view of a front surface of an article which is nearest to said open end of said chamber, said free end portions of said springy members having a length which is only a small fraction of the length of said flanges and being situated between opposed ends of said flanges while extending inwardly beyond said flanges into overlapping relation with an article which is nearest to said open end of said chamber to an extent sufficient only for securely retaining the latter article at the open end of said chamber while still leaving substantially the entire front surface of the article nearest to the open end of said chamber uncovered and visible for displaying substantially the entire front surface of the article.

4,106,669

SUGAR CANE PLANTING MACHINES

Sidney E. Longman, 510 Ibert St., Franklin, La. 70538

Filed Mar. 8, 1976, Ser. No. 665,108
Int. Cl.² B65H *5/12*
U.S. Cl. 221—217 **9 Claims**



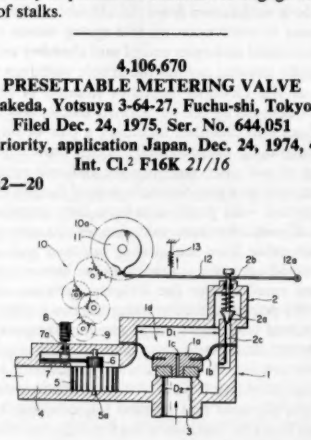
1. A sugar cane planter cart comprising a cart,
a boom pivotally mounted on said cart, and
a circular plate rotatably mounted in a vertical plane within said cart on said boom adjacent a load of sugar cane stalks and having a plurality of V-shaped elements about the periphery of said plate to engage a stalk within the V and drive the stalk downwardly and rearwardly from the load, said boom having pivotal movement both vertically and horizontally to permit the elements to engage the exposed layer of stalks.

4,106,670

PRESETTABLE METERING VALVE

Yoshiaki Takeda, Yotsuya 3-64-27, Fuchu-shi, Tokyo-to, Japan

Filed Dec. 24, 1975, Ser. No. 644,051
Claims priority, application Japan, Dec. 24, 1974, 49-1704
Int. Cl.² F16K *21/16*
U.S. Cl. 222—20 **7 Claims**



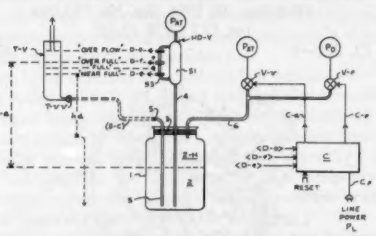
1. A valve which closes after a predetermined volume of fluid passes therethrough comprising:
means forming a flow path for the fluid;
a main valve controlling flow through said flow path
a trigger valve in communication with said main valve;
a conversion mechanism arranged in the flow path of said fluid with means to translate the amount of fluid flowing through said flow path into proportional amount of motion and
a cam mechanism comprising:
a cam shaft driven by said conversion mechanism;
a first cam having a high portion and low portion fixed to said cam shaft;
a second cam slidably mounted to said cam shaft and having a high portion and low portion;
said second cam being angularly adjustable on said cam shaft with respect to said first cam;
said trigger valve being equipped with a valve stem; and
an actuator fixed to the valve stem of said trigger valve and having one end biased against cam surfaces of both of said first and second cams;
setting means for moving said cam shaft and said cams to a first position prior to commencement of fluid flow and biasing means responsive to release of said setting means for moving said cam shaft and said cams from said first position to a second position at which flow commences.

4,106,671

LIQUID HEAD CONTROL SYSTEM

Thomas Davy Sharples, Atherton, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Continuation of Ser. No. 627,804, Oct. 31, 1975, abandoned.
This application Mar. 21, 1977, Ser. No. 779,379
Int. Cl.² B67D *5/54*
U.S. Cl. 222—61 **6 Claims**



1. In an improved automatic liquid dispensing system including a closed storage vessel for holding a prescribed volume of liquid to be dispensed to a use point in selectable dosages and upon demand, said closed storage vessel having a bottom, the combination therewith of:
an intermediate dispensing system including a closed transfer vessel hydraulically coupled between said storage vessel and said use point, said transfer vessel being designed to hold a fraction of the liquid capacity of said storage vessel;
an automatic replenishment control means adapted to automatically control the transfer of said liquid from the storage vessel to the transfer vessel; and
a pneumatic drive means comprising controlled gas pressurizing means and controlled gas venting means for placing a pressurized gas supply in pneumatic communication with said storage vessel sufficient to effect said replenishment in response to prescribed replenishment signals from said control means; and
wherein said automatic replenishment control means comprises a liquid level detecting sub-system comprising a riser tube having one end terminating adjacent the bottom of said storage vessel and the other end opening to the atmosphere, a plurality of detect units for detecting the presence of liquid at a minimal and other prescribed hydraulic reference levels in said riser tube, said detect units being mounted adjacent said riser tube; wherein each unit

is coupled to apply signals to manipulate said control means; and wherein some of said signals are adapted to enable said gas pressurizing means and other of said signals are adapted to enable said gas venting means.

4,106,672

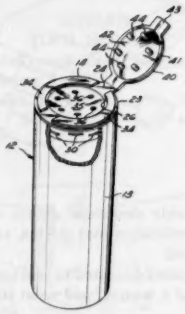
RESEALABLE END CLOSURE HAVING PLURAL OPENINGS

Charles Tecco, Northfield, and Lawrence E. Lasich, Twinsburg, both of Ohio, assignors to Weatherchem Corporation, Twinsburg, Ohio

Continuation-in-part of Ser. No. 673,073, May 26, 1976, Pat. No. 4,029,202. This application Jun. 6, 1977, Ser. No. 803,721

Int. Cl.[2] B65D *39/04, 41/18, 43/16*

U.S. Cl. 222—151 **11 Claims**



10. A one-piece plastic end closure comprising a generally flat annular ring like base, said base having a top wall and a bottom wall and a central opening, a dish-shaped dispensing wall in said central opening, a plurality of dispensing holes in said dispensing wall, a tab movable between an open position and a closed position, said tab being a disc shaped member hingedly connected to said base, said tab including a longitudinally recessed dish-shaped center portion extending longitudinally into said opening of said base and covering said dish-shaped dispensing wall when said tab is in said closed position, and said tab including a pin extending from said dish-shaped portion of said tab into each of said dispensing holes in said dispensing wall when said tab is in said closed position.

4,106,673

APPARATUS FOR MEASURING AND DISPENSING LIQUID

Robert J. Donoghue, 4 Burnwood Dr., Bloomfield, Conn. 06002

Filed Mar. 21, 1977, Ser. No. 779,630

Int. Cl.[2] B65D *37/00*

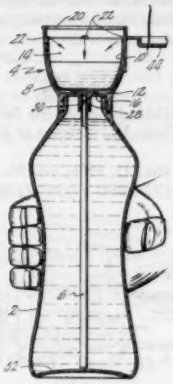
U.S. Cl. 222—207 **10 Claims**

1. Apparatus for measuring and dispensing liquid comprising a reservoir container having a flexible wall;

measuring and dispensing means disposed on said reservoir container, said measuring and dispensing means comprising an outer wall member and an inner wall member, said inner wall member being disposed within said outer wall member and spaced therefrom to define liquid passage means between said outer wall member and said inner wall member, said inner wall member defining a measuring chamber therewithin;

liquid communication means between said liquid passage means and said measuring chamber; and

liquid transfer means in communication with said reservoir container and said liquid passage means, whereby liquid may be transferred into said measuring chamber from said



reservoir container, through said liquid transfer means, said liquid passage and said liquid communication means.

4,106,674

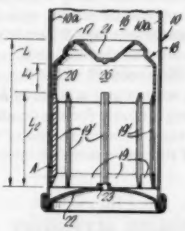
PRESSURE-OPERATED CONTAINER FOR VISCOUS PRODUCTS

Robert S. Schultz, 7 Heusted Dr., Old Greenwich, Conn. 06870

Continuation-in-part of Ser. No. 616,363, Sep. 24, 1975, Pat. No. 4,023,717, which is a continuation-in-part of Ser. No. 459,328, Apr. 9, 1974, abandoned. This application Aug. 4, 1976, Ser. No. 711,681

Int. Cl.[2] B67D *5/54*

U.S. Cl. 222—386.5 **18 Claims**



10. In combination, a pressure container comprising an elongate cylindrical body with a closed upper end, dispensing-valve means in said upper end, a one-piece molded piston of resiliently deformable material and integrally including a closed upper head end and a tubular body structure extending downwardly within the cylinder of the container wall and united to the closed end of said piston, said tubular body structure comprising a relatively thin resiliently expandable first circumferential tubular band of large continuously smooth surface area and predetermined axial length circumferentially continuously connected to and near said closed upper end, said first circumferential band having an upper end connected to the closed end of said piston, said first band also having a lower end, a second circumferential band near the open end of said piston, said second band being connected in axially spaced relation to said first band by plural angularly spaced longitudinal members integrally formed with the lower end of said first band and with the upper end of said second band, said tubular body structure being open in the spaces between longitudinal members; a viscous product in the space between said piston and valve means, pressure-sealing means closing the lower end of said container to define a pressure chamber beneath said piston, and a predetermined charge of gas under pressure in the

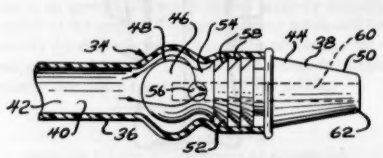
pressure chamber and for pressure-loading said first band into peripheral and axially continuous light sealing and stabilizing contact with the container wall during a product-dispensing operation, said stabilizing contact being aided by second-band contact with the container wall.

4,106,675

LIQUID SAMPLING DEVICE

Glenn N. Taylor, Cary, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Dec. 22, 1976, Ser. No. 753,113
Int. Cl.[2] B65D *47/26;* F16K *31/14*
U.S. Cl. 222—556 **14 Claims**



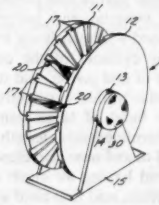
1. A drainage bag, comprising:
a receptacle having a liquid collection chamber;
a conduit connected to said receptacle and communicating with a lower portion of said chamber for draining liquid from the receptacle chamber, said conduit including a sampling section of flexible material having a wall defining a lumen and an outer surface adapted to be squeezed by a user's fingers; and
a flow control element comprising, a rigid valve member positioned in the lumen of said sampling section, said valve member having an outer sealing surface sealingly engaging against an inner surface of the sampling section, said sampling section deforming when said wall surface is squeezed from opposed directions against the valve member to permit passage of a liquid sample between the valve member and an inner surface of the sampling section, said valve member being secured in the lumen at an outer end of the sampling section and said valve member having an extension defining a nozzle for the conduit and a passageway communicating between an end of the nozzle and an outer surface of the valve member intermediate its ends.

4,106,676

SEWING ACCESSORY

Judy Freerking, 1406 59th St., Kenosha, Wis. 53140

Filed Jul. 14, 1977, Ser. No. 815,570
Int. Cl.[2] A41H *31/00*
U.S. Cl. 223—106 **5 Claims**



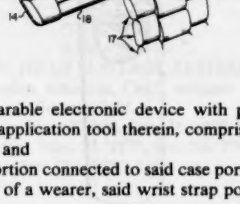
1. A thread storage device comprising:
a cylindrical central mount;
a first and second annular disk disposed in axial alignment about said cylindrical mount in spaced relationship proximate the ends thereof, each said annular disk including a plurality of radial slots arranged in opposingly adjacent alignment, said slots being tapered in planform towards the interior of said disks, and a corresponding plurality of circular recesses formed at the interior ends of said slots; and
a plurality of substantially rectangular planar bobbins received between the opposing ones of said slots each including a bead on one transverse edge thereof inserted in said recesses.

4,106,677

WRIST WEARABLE ELECTRONIC DEVICE WITH AN ENGAGEDLY STORED SELECTED TOOL

Bennie E. Helmso, Los Altos; Thomas E. Holden, Scotts Valley, both of Calif., and Edward T. Liljenwall, Corvallis, Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 19, 1976, Ser. No. 715,805
Int. Cl.[2] A44C *5/02*
U.S. Cl. 224—5 A **2 Claims**



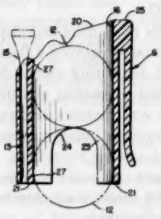
1. A wrist-wearable electronic device with provision for storing a special application tool therein, comprising:
a case portion; and
a wrist strap portion connected to said case portion to encircle the wrist of a wearer, said wrist strap portion including:
a selected number of complete links; and
at least one special link having:
a body portion connectable, independent of the special application tool, to at least one other link of either type adjacent thereto, said body portion defining a cavity and;
the special application tool being removable for performing selected operations upon one of said case and wrist strap portions, a portion of the special application tool being storable within the cavity of said body portion, and when the special application tool is so stored, another portion of the special application tool blends with the body portion to complete the external appearance of the special link so that it resembles a complete link.

4,106,678

GOLF BALL AND TEE CADDY

Thomas Thomas, Hollywood, Fla., assignor to Tatco Inc., Hollywood, Fla.

Filed Aug. 31, 1977, Ser. No. 829,535
Int. Cl.[2] B65D *71/00*
U.S. Cl. 224—5 D **2 Claims**



1. An integrally molded golf ball holder comprising a verti-

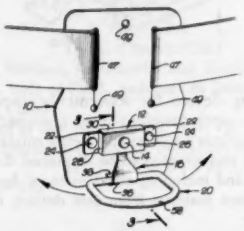
cally disposed elongated hollow body member being open at both ends thereof and having an internal diameter such that a golf ball is slideably received therein, arcuate cut out portions defining a pair of transversely spaced arcuate side walls and a pair of diametrically opposed openings disposed at the lower end of said body, said side walls being leg-defining walls which engage and retain a golf ball; holding means comprising cylindrical tubes molded integrally with said holder adapted to receive the shank of a golf tee vertically arranged on the front and sides of said body, means integral within said body for removably retaining a golf ball disposed therein whereby a ball is removed from the holder by downward movement across said means by force applied with the fingers through said diametrically opposed openings, and retaining means provided at the rear of said holder whereby the holder can be attached to pants, shirt or wearing apparel of a golf player.

4,106,679

TOOL HOLDER

George Hillinger, Hollywood, Calif., assignor to Action Leathercraft, Inc., Commerce, Calif.

Filed Jan. 26, 1977, Ser. No. 762,566
Int. Cl.[2] A45F 5/00
U.S. Cl. 224—26 B **14 Claims**



1. A tool holder for supporting from a waist belt an implement of the type having a shaft and a crosspiece transverse to the shaft, comprising:

pad means for supporting a tool suspension arrangement adjacent thereto;

a protruding support element including means spaced apart from the pad means for supporting pivot means generally normal to the pad means;

pivot means coupled to the pad means defining a swivel axis normal to the pad and the support element for swivelably supporting a tool suspension loop; and

means including a tool loop pivotally coupled to the pivot means and spaced apart from the swivel axis for suspending a tool of the aforementioned type in swivelable relationship from the tool crosspiece so that a shaft of a tool when inserted in the loop remains in a generally upright position and is prevented from falling out of the loop when the pad means is at an angle to a nominal wearing position and so that the tool and the tool loop may be readily rotated facilitating tool insertion and removal from the tool loop and enhancing the comfort of the wearer.

4,106,680

VEHICLE ARTICLE CARRIER

John A. Bott, 931 Lakeshore Dr., Grosse Pointe Shores, Mich. 48236

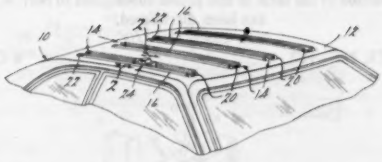
Filed May 5, 1976, Ser. No. 683,419
Int. Cl.[2] B60R 9/00
U.S. Cl. 224—29 R **18 Claims**

1. In combination in a vehicle article carrier for mounting on a planar surface of a motor vehicle comprising at least one generally horizontally arranged article supporting slat having an upwardly opening slot extending longitudinally thereof,

said slot being defined by a bottom wall and upwardly converging substantially flat side walls,

a load constraining member on said slat having a fastening element extending between said member and the interior of said groove, and

retaining element disposed within said groove and operatively connected to said fastening element, said retaining element having at least one upwardly inclined surface, said surface being inclined at substantially the same angle



from the vertical axis extending through said slat as said upwardly converging side walls,

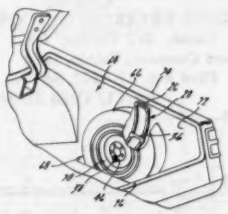
said retaining element being rotatable between a first orientation permitting removal and insertion thereof through the top of said groove, and a second orientation wherein said surface operatively engages at least one of said sidewalls of said groove so as to exert a clamping action between said sidewalls and said load constraining member for fixedly attaching said load constraining member to said slat at any longitudinal position along said slat.

4,106,681

SPARE TIRE EXTRACTION DEVICE

John A. Bott, 931 Lakeshore Dr., Grosse Pointe Shores, Mich. 48236

Filed Jun. 14, 1976, Ser. No. 696,029
The portion of the term of this patent subsequent to Aug. 9, 1994, has been disclaimed.
Int. Cl.[2] B62D 43/00
U.S. Cl. 224—42.12 **10 Claims**



1. In combination,

an automotive vehicle having a longitudinal axis and a spare tire storage area,

a generally upstanding wall along an access side of said storage area,

a spare tire assembly including a tire and wheel,

said wheel having a plurality of holes formed therein and a flexible strap having a length equal to at least the radial distance between said holes and the outer periphery of said assembly and having a fastening element at one end thereof, a first handle at the opposite end thereof and a second handle at an intermediate position between said fastening means and said first handle,

said fastening element extending axially through and cooperative with one of the holes for securing said one end of said strap to said assembly,

said strap having a main body portion and extending radially of said assembly along one side thereof from said one hole to a position where said first handle may be conveniently grasped by a person reaching into said storage area,

whereupon said strap may be pulled in a direction causing said assembly to move toward a first position partially out of said storage area, whereby the person may grasp the second handle and continue to pull said strap until said assembly is removed from said storage area.

4,106,682

SHEARING TOOL FOR STRUCTURAL MEMBERS

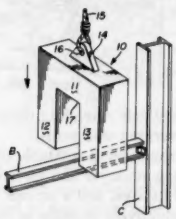
Michael Ramun, 3180 Fifth Ave., Youngstown, Ohio 44505

Filed May 4, 1976, Ser. No. 682,983

The portion of the term of this patent subsequent to Nov. 4, 1992, has been disclaimed.

Int. Cl.[2] B26F *3/00*

U.S. Cl. 225—103 **6 Claims**



1. A shearing tool comprising an inverted U-shaped relatively large heavy steel body member as compared with structural members such as beams in a building being dismantled and including a horizontal upper section, right angular lower horizontal edges on said horizontal upper section and a pair of spaced depending vertical sections integral with said horizontal upper section and means on said horizontal upper section to which a supporting element can be attached whereby the shearing tool may be alternately lifted and dropped so as to move downwardly straddling said structural member to be sheared so as to shear the same upon impact of said horizontal upper section therewith.

4,106,683

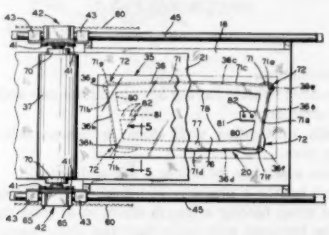
GLASS BREAKING OUT APPARATUS

William P. Gulish, Jr., Curtice, Ohio, assignor to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Aug. 11, 1977, Ser. No. 823,582

Int. Cl.[2] C03B *33/04*

U.S. Cl. 225—103 **6 Claims**



1. In apparatus for breaking out a scored glass pattern from a glass blank including a supporting surface, a template supported on said supporting surface, a resilient glass supporting means overlying the template, means positioning said glass blank on said resilient glass supporting means to vertically align the score line of said glass blank with said template, and pressure applying means engageable with said glass blank to snap the glass along said score line; the improvement in which said template comprises a body having a generally flat planar surface terminating in a major marginal edge complementary to but slightly larger than the outline of the score line formed on the overlying glass blank, said template having discrete lateral extensions along selective portions of said marginal edge and projecting outwardly therebeyond to limit downward movement of overlying marginal glass portions outwardly of said score line when snapped.

4,106,684

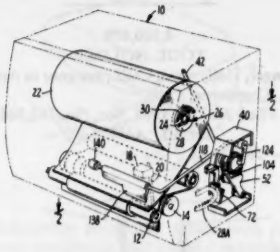
SHEET MATERIAL DISPENSING DEVICE

Ellsworth A. Hartbauer, Concord; Rudolf R. Weis, Antioch, and Horace N. Kemp, Walnut Creek, all of Calif., assignors to Crown Zellerbach Corporation, San Francisco, Calif.

Filed Aug. 26, 1977, Ser. No. 828,000

Int. Cl.[2] B65H *17/42*

U.S. Cl. 226—91 **3 Claims**



1. A dispensing device for sequentially dispensing sheet material such as paper toweling from a primary roll and a reserve roll, said primary roll initially being rotatably mounted at a first location and adapted to be displaced therefrom to a second location, and including sheet material feed means for dispensing the sheet material from said device, the improvement comprising:

sensing means for sensing displacement of said primary roll from said first location, and

transfer means in operative association with said sensing means and responsive to the sensing of the displacement of said primary roll from said first location by said sensing means to place sheet material from said reserve roll into operative engagement with said sheet material feed means after said primary roll is located at said second location, said transfer means including metering means for metering sheet material removed from said primary roll by said feed means after displacement of said primary roll from said first location has been sensed by said sensing means and said primary roll is at said second location, said transfer means being responsive to the metering of a length of sheet material having been removed from said primary roll before placing the sheet material from said reserve roll into operative engagement with said sheet material feed means.

4,106,685

SEMI AUTOMATIC FILM CUTTER WITH MOVABLE CURSOR

Gerald R. Strunc, Maple Grove, and Warren J. Osby, Minneapolis, both of Minn., assignors to Pako Corporation, Minneapolis, Minn.

Filed Apr. 28, 1977, Ser. No. 791,704

Int. Cl.[2] B65H *17/22, 35/06*

U.S. Cl. 226—136 **18 Claims**

1. In a photographic system, web advancement means for advancing a web, the web advancement means comprising:

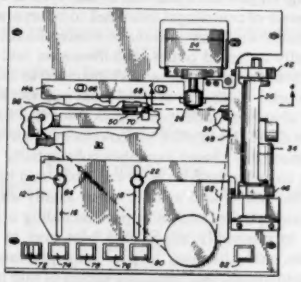
movable cursor means for indicating, by its position, a feed length desired;

bidirectional encoder means for providing encoder signals when the movable cursor means is moved;

up/down counter means for counting from a reference

count in response to the encoder signals to produce a feed length signal count;

calibration mark means for indicating a reference position for the movable cursor means;



calibrate switch means for setting the up/down counter means to the reference count when the movable cursor means is positioned at the reference position; and

drive means for advancing the web by a distance determined by the feed length signal count.

4,106,686

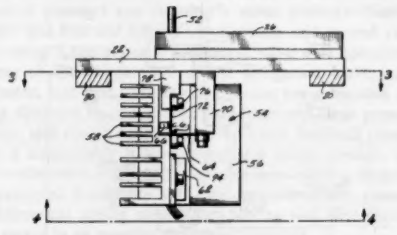
TAPE TRANSPORT

William W. Valliant, La Canada, and Manfred G. Michelson, Van Nuys, both of Calif., assignors to Data Electronics, Inc., Pasadena, Calif.

Continuation of Ser. No. 631,230, Nov. 12, 1975, abandoned. This application May 19, 1977, Ser. No. 798,643

Int. Cl.[2] B65H *17/18*

U.S. Cl. 226—188 **26 Claims**



1. A tape transport assembly for driving a tape comprising:

tape drive means including a capstan for driving a tape, and a motor for driving the capstan, the tape drive means having a center of gravity and a pivotal axis extending through the center of gravity;

tape support means for positioning a tape supply means in an operative position relative to the capstan so that capstan-engaging means within the tape supply means enables a tape to be driven in response to rotation of the capstan; and

spring-biasing means mounting the tape drive means to pivot relative to the tape support means about said pivotal axis to provide spring-biased engagement of the capstan with said capstan-engaging means so that, when the tape supply means is mounted in said operative position, the capstan will continuously apply a substantially constant force to said capstan-engaging means, independently of external forces acting on the tape support means and the tape drive means, when the tape support means is mounted in a fixed position and the tape drive means is allowed to pivot freely relative to the tape support means through said spring-biasing means.

4,106,687

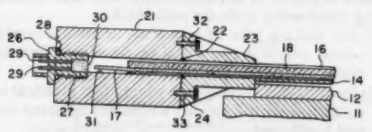
TOTALLY CONFINED EXPLOSIVE WELDING

Laurence J. Bement, Newport News, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 289,048, Sep. 14, 1972, Pat. No. 3,797,098. This application Sep. 10, 1973, Ser. No. 395,493

Int. Cl.[2] B23K *21/00*

U.S. Cl. 228—2.5 **3 Claims**



1. An apparatus for limiting the disturbing noise and hazardous debris of an explosive bonding procedure while transmitting the explosive pressure to the area to be bonded comprising:

infrangible enclosure means removably attached to one of the members to be bonded at the point directly opposite the bond area;

explosive means completely confined inside the infrangible enclosure means at a point of close proximity to the member to be bonded;

detonating means attached to said explosive means to initiate the explosive within the infrangible enclosure means; and the balance of the enclosure not occupied by explosive filled with a shaped material which directs the explosive pressure toward the bond area.

4,106,688

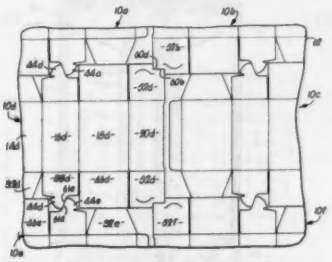
MATING BLANKS

Walter S. Berger, Overland Park; Andrew Paul Erhart, Lawrence, both of Kans.; William O. Fee, Raytown, Mo.; Darwin Lester Holtgren, Shawnee, Kans., and Burd & Fletcher Company, Kansas City, Mo.

Continuation of Ser. No. 693,365, Jun. 7, 1976, abandoned. This application Jul. 22, 1977, Ser. No. 818,146

Int. Cl.[2] B65D *5/11*

U.S. Cl. 229—39 R **7 Claims**



1. A carton blank, comprising:

a unitary sheet of material cut and configured to present substantially rectangular first, second, third and fourth panels connected in order along a first series of mutually parallel fold lines;

a pair of closure flaps respectively connected to the opposite ends of said first, second, third and fourth panels along mutually parallel marginal fold lines, with the flaps of each respective set thereof being substantially mirror images of one another,

each of said third panel closure flaps being substantially

rectangular in shape and having an outermost edge which is spaced a first distance from and parallel to the adjacent fold line along which the third panel closure flap is connected to the third panel,

each of said second panel closure flaps being defined in part by an outermost cut line remote from said second panel which presents an outwardly projecting locking lobe and a recess between said locking lobe and the adjacent side edge of the proximal third panel closure flap,

said locking lobe and recess being cooperatively configured and arranged such that, when a first blank identical to said blank is placed in oppositely disposed, side-by-side abutting relationship with the said blank,

(1) the locking lobe of said blank is complementally received within the proximal recess of said first identical blank,

(2) the proximal locking lobe of said first identical blank is complementally received within the adjacent recess of said blank, and

(3) the outermost edges of the locking lobes of said blank and first identical blank are each located a second distance from the second panel of the adjacent blank, said second distance being less than said first distance whereby the respective locking lobes each extend into the recess of the adjacent blank,

said fourth panel closure flaps each having locking means thereon for receiving the locking lobe of the adjacent second panel closure flap, and being defined in part by a cut line remote from said fourth panel and the adjacent third panel closure flap,

said last-mentioned cut line being configured and arranged to present an abutment edge for complementally abutting the abutment edge of a second identical blank placed in catercorner relationship with said blank, with the fourth panel of said blank being proximal to the fourth panel of said second identical blank.

4,106,689

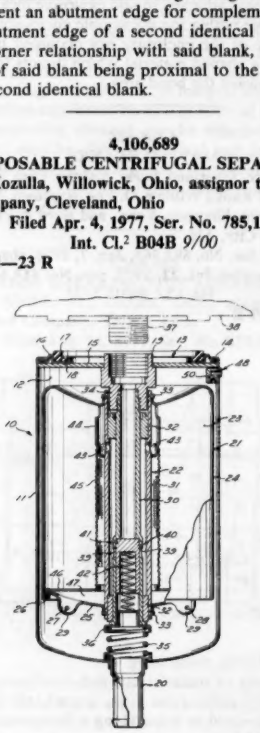
DISPOSABLE CENTRIFUGAL SEPARATOR

Robert E. Kozulla, Willowick, Ohio, assignor to The Weatherhead Company, Cleveland, Ohio

Filed Apr. 4, 1977, Ser. No. 785,124

Int. Cl.[2] B04B 9/00

U.S. Cl. 233—23 R **8 Claims**



1. In a centrifugal separator for separating contaminants from contaminated fluids and being disposable by virtue of its economical construction, comprising shroud means having ends and intermediate sides defining a first chamber, vertically extending spindle within said shroud means and having a hollow rotor rotatably mounted thereon, said hollow rotor defining a second chamber for receiving contaminated fluids to be separated, inlet port means at one end of said spindle and shroud means, passage means through said spindle to said second chamber, means to rotate said rotor and thereby cause contaminants in contaminated fluids within said second chamber to migrate toward a sidewall of said second chamber under the influence of centrifugal force and to be separated from such contaminated fluids, said means to rotate said rotor comprising tangentially mounted outlet port means on said rotor in fluid communication with said second chamber to cause said rotor to rotate upon discharge of fluid from said second chamber to said first chamber, outlet port means from said first chamber, in combination therewith the improvement wherein said shroud is a permanently closed assembly substantially fully defining said first chamber with its sides and ends, said inlet port means at said one end of said spindle being axially aligned with the axis of said spindle, said inlet port including attaching means adapted to releasably attach said inlet port to a fitting on a crankcase, said attaching means being permanently fixed to said shroud means, said attaching means of said inlet port being constructed and arranged to be capable of providing substantially the sole support of said separator on said crankcase whereby said separator is readily removed from said crankcase by release therefrom of said attaching means, and said outlet port means being at the other end of said shroud means.

4,106,690

OPTIMUM START CONTROLLER

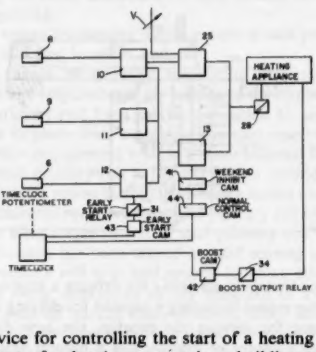
Colin Henry Tomlinson, Gravesend, England, assignor to Rochester Instrument Systems Limited, Crayford, England

Filed Nov. 7, 1975, Ser. No. 629,697

Claims priority, application United Kingdom, Nov. 7, 1974, 48326/74

Int. Cl.[2] F23N 5/20

U.S. Cl. 236—46 R **18 Claims**



1. A device for controlling the start of a heating appliance forming part of a heating system in a building comprising means for producing a time-variable signal comprising

a time clock having a 24-hour drive shaft and means for varying an electrically measurable parameter, said drive being coupled directly to said varying parameter means;

and including a variable biasing circuit for adjusting said time-variable signal to modify the control to suit the characteristics of a building in which the heating system is installed;

and including means coupled to said means for producing said time-variable signal for automatically adjusting said time-variable signal to cause said appliance to be started earlier, prior to a heating period following an interval more prolonged than the daily cooling cycle of the heating system;

a first temperature transducer located on the inside of said building; a second temperature transducer located on the outside of said building; proportional summing means for combining the outputs of said first and second transducers

in respective predetermined proportions; and control means for combining said time variable signal with the output of said proportional summing means to produce an output to control said heating appliance.

4,106,691

VALVE ARRANGEMENT FOR REFRIGERATION PLANTS

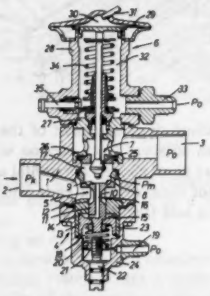
Leif Nielsen, Nordborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Jan. 11, 1977, Ser. No. 760,631

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1976, 2603682

Int. Cl.² F25B *41/06*

U.S. Cl. 236—92 B **4 Claims**



1. A valve assembly for a refrigeration system having a condenser and an evaporator, comprising, a casing defining a condenser inlet passage and an evaporator outlet passage, first and second throttle valve means in series between said inlet and outlet passages and forming a mean pressure chamber between said first and second valve means, said second valve means being a thermostatic expansion valve unit operable in response to the temperature of the refrigerant leaving said evaporator, said first throttle valve means being biasable in a closing direction by pressurized fluid from said mean pressure chamber, said casing defining an evaporator feedback passage which is connectable to said evaporator outlet passage, said first throttle valve means being biasable in an opening direction by pressurized fluid from said evaporator feedback passage, and differential spring means also biasing said first throttle valve means in an opening direction.

4,106,692

HEATING SYSTEM WITH RESERVE THERMAL STORAGE CAPACITY

John F. Baier, 9 E. 40th St., New York, N.Y. 10016

Filed Jan. 28, 1977, Ser. No. 763,428

Int. Cl.² F24D *3/02, 3/08*

U.S. Cl. 237—8 R **4 Claims**

1. In a space heating system comprising:

a boiler for heating water

a source of heat for said boiler

a plurality of room heat exchangers in a group of zones

a connection from said boiler to said room heat exchangers,

means for controlling said connection from said boiler to said room heat exchangers to permit a supply of heated water to said room heat exchangers and to close said supply;

a return from said room heat exchangers;

the invention which comprises a heat bank;

said return being connected to said heat bank;

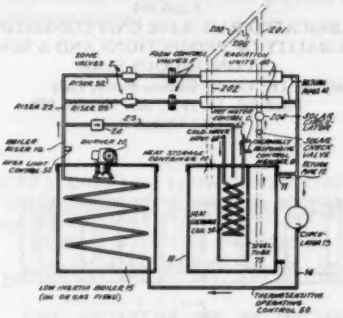
an output connection from said heat bank to said heating system;

and an input connection from said boiler to said bank, the volume of the heat bank being substantially greater than that of the boiler;

said system including a flow circulator; and a flow regulator in the circuit from the boiler to the room heat exchanger to the heat bank; the flow to the room heating system being less than the flow to the heat bank;

said heat bank providing a supply of heated water for said system while the source of heat for said boiler is turned off;

heat sensing means at each room heat exchanger connected to and controlling said circulator;



heat sensing means at said heat bank controlling the operation of said boiler heat source;

a heat exchange coil for domestic hot water carried in said heat bank;

the connection from said boiler to said heat bank being at the top of said heat bank and the input and output connections for the heat exchange coil being at the top of said heat bank;

a vertical shroud within said heat bank surrounding said heat exchange coil; the bottom of said shroud being open and the top of said shroud receiving the input of the connection from said boiler to said heat bank.

4,106,693

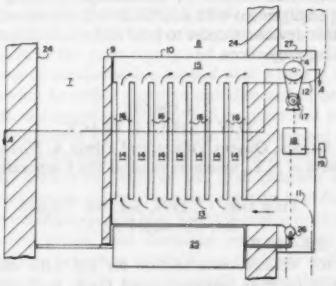
AUTOMATIC FIREPLACE HEATING SYSTEM

John F. Oliver, 112 W. 31st St., Wilmington, Del. 19802

Filed Apr. 22, 1977, Ser. No. 790,014

Int. Cl.² F24B *7/04*

U.S. Cl. 237—51 **2 Claims**



1. Automatically controlled residential heating system based on the heat from a fireplace comprising a fireplace, hearth, combustion zone, flue, and damper for opening and closing a passageway from the combustion zone to the flue, said flue being divided into two full-sized parallel independent flue passages by a flue divider, one of which is an unobstructed normal flue passage and the other of which is filled with a heat

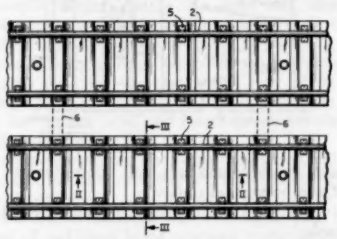
exchanger adapted to absorb the heat from hot flue gases passing through the flue into air inside said heat exchanger, a movable diverter adapted to direct the hot flue gases into either parallel flue or into both in any desired proportion, a means for circulating air through said heat exchanger and releasing the absorbed heat through space heaters at other locations, temperature sensing means for sensing the heat in the space to be heated by space heaters, and means for automatically positioning said diverter to by-pass none, all, or any part of said hot flue gases from said heat exchanger in response to the temperature of the said sensing means.

4,106,694

PREFABRICATED RAIL BASE UNIT CONSISTING OF A PLURALITY OF PROJECTIONS AND A SINGLE CONTINUOUS SLAB

Santo Salvino, 117 Via dei Glicini, Rome, Italy

Filed Jul. 13, 1976, Ser. No. 704,808
Int. Cl.[2] E01B *3/38*
U.S. Cl. 238—10 C **9 Claims**



1. A railroad bed assembly for supporting thereon metallic railroad tracks comprising a base structure consisting essentially of reinforced concrete formed from a plurality of adjacently located prefabricated blocks, said prefabricated blocks including a slab section installed over a ground formation at a railroad bed site and at least two upwardly extending projections running transversely to said tracks each having a trapezoidal cross sectional configuration taken in a plane extending parallel to said tracks, said at least two projections and said slab being integrally formed of reinforced concrete with said at least two projections forming cross ties for supporting said tracks thereon, said slab being formed as an essentially solid continuous body between said projections, said projections having embedded therein attachment devices, said tracks being arranged to directly overlie said trapezoidal projections and being connected thereto by mechanical fastening means in gripping engagement with said tracks and connected with said attachment devices in order to hold said tracks directly on said trapezoidal projections.

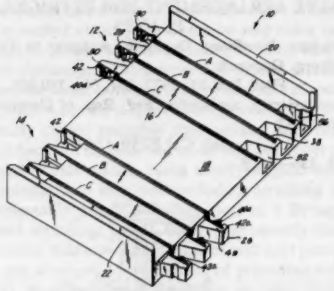
4,106,695

TOY VEHICLE TRACK

Vincent Carella, Queens Village, and Edwin A. Nielsen, Oceanside, both of N.Y., assignors to Ideal Toy Corporation, Hollis, N.Y.

Filed Dec. 17, 1976, Ser. No. 751,636
Int. Cl.[2] A63H *19/30*
U.S. Cl. 238—10 F **27 Claims**

1. A toy vehicle track section for use with similar track sections to form an interconnected track; said track section comprising a base formed of an electrically non-conductive material having opposite ends and a track surface along which a vehicle can move; one of said ends having a plurality of generally wedge shaped projections extending longitudinally therefrom; said projections having upper surfaces lying in planes below the plane of said track surface; the other of said ends having a plurality of generally wedge shaped recesses formed in said track surface, said recesses each having an open side at the track surface and an open end at said other of the track ends for receiving the projections of an adjacent track section in contacting engagement, upon longitudinal insertion of said projections through said recess ends, said recesses and projections having cooperating means formed thereon for



resisting longitudinal disengagement of the projections from the recesses of an adjacent track section whereby connected track sections may pivot about a horizontal axis with respect to one another about their adjacent ends without producing an obstruction above said track surface.

4,106,696

SLEEPER OF STEEL OR SIMILAR MATERIAL

Josef Carl-Olof Andersson, Kornettgården, Norberg, Sweden

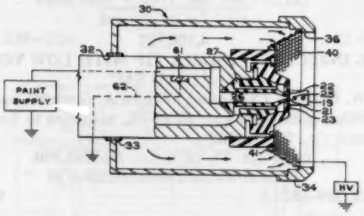
Filed Oct. 19, 1976, Ser. No. 733,889
Int. Cl.[2] E01B *3/16, 9/22*
U.S. Cl. 238—62 **5 Claims**

1. An intermediate sleeper for a pair of railway rails each of said rails comprising a web having a foot which includes first and second flanges extending in opposite directions relative to said web, wherein each said sleeper is one of a plurality of identical sleepers which support said rails at positions spaced inwardly from the ends thereof, each said sleeper comprising a web having at least one upwardly extending flange having a pair of upwardly open recesses therein for receiving one rail each of said pair of rails inserted vertically from above into said respective recess, each of said recesses being partially closed by at least one downwardly convex lug, the spacing between said lug and said first rail flange adjacent thereto increasing towards said rail web, the end of said lug furtherest spaced from said first rail flange contacting said rail web, the spacing between the side of each of said recesses opposing said lug and said rail web increasing away from said rail web, and the end of said second rail flange contacting said opposing side.

4,106,697
SPRAYING DEVICE WITH GAS SHROUD AND ELECTROSTATIC CHARGING MEANS HAVING A POROUS ELECTRODE

James E. Sickles, Glenshaw; Joseph V. Hornyak, Lower Burrell, and Helmut Franz, Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 718,633, Aug. 30, 1976, abandoned. This application Nov. 16, 1976, Ser. No. 742,294
Int. Cl.[2] B05B 5/02, 12/12
U.S. Cl. 239—15 **38 Claims**

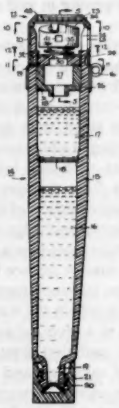


1. Spray apparatus for spraying dispersed electrically charged particulate coating material in a controlled atmosphere, comprising:
a chamber having an opening,
dispersing means mounted in said chamber for dispersing a stream of coating material into a spray of particles directed outwardly of the opening in the chamber,
inlet means mounted in said chamber for delivering a flow of gas to said chamber, said inlet means and said dispersing means being in spaced relationship within said chamber whereby said gas exits through said opening and substantially envelops said spray, and
electrode means adjacent said dispersing means, a portion of said electrode means being porous.

4,106,698
PERSONAL AUTOMATIC VAPORIZER

A. Oscar Lin, Woodside, N.Y., assignor to Yorker Research Corporation, Woodside, N.Y.

Filed Dec. 29, 1976, Ser. No. 755,203
Int. Cl.[2] A24F 25/00
U.S. Cl. 239—34 **24 Claims**

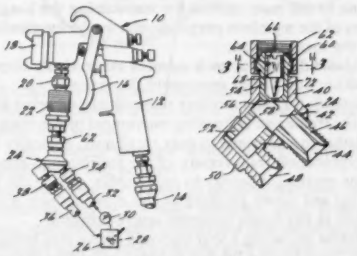


1. A personal automatic vaporizer comprising
a housing having a pair of chambers for receiving respective vaporizing liquids therein, said housing having a first discharge opening communicating one of said chambers with the exterior of said housing, and a second discharge open communicating the other of said chambers with the exterior of said housing,
at least said first opening being of a size sufficient to render the total force of surface tension and the attractive force between the liquid in said first chamber and said housing greater than the weight of the liquid in said first chamber,
a cap removably secured to said housing over said first discharge opening to close said first discharge opening, and
a movable cap secured to said housing over said second discharge opening to selectively open and close said second discharge opening.

4,106,699
RECIRCULATING PAINT FLOW CONTROL DEVICE

Earl R. Holt, Rochester, Mich., assignor to Hose Specialties Company, Detroit, Mich.

Filed Jan. 24, 1977, Ser. No. 762,050
Int. Cl.[2] B05B 9/04
U.S. Cl. 239—124 **11 Claims**



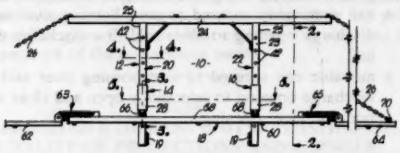
1. In a paint spray apparatus including a spray nozzle and a recirculating paint supply system for supplying a liquid coating composition to the spray nozzle in an amount in excess of that required, the improvement comprising a flow control device in the recirculating suppy system for regulating the amount of paint supplied to the spray nozzle, said flow control device comprising a body formed with an internal chamber having an inlet port adapted to be connected to a supply conduit connected to a supply of pressurized paint, an outlet port connected to a return conduit for returning the excess of the recirculating paint to the paint supply and an elongated discharge port defining an axial chamber formed with a base at its inner end and having an orifice therethrough disposed in communication with said internal chamber and an outer end provided with coupling means for coupling said axial chamber in communication with a spray nozzle, said inlet port oriented with its axis aligned toward said base of said axial chamber and said orifice therethrough so that the paint entering said flow control device impinges on said base and said orifice providing for a self-cleaning action, said discharge port provided with a threaded section extending axially along the inner wall of said axial chamber, a flow control needle valve including a threaded body portion disposed in threaded engagement in said threaded section and a tapered end portion disposed in adjusted flow restricting relationship and axial alignment relative to said orifice, said axial chamber formed with a least one axially extending channel between said threaded section and said threaded body portion providing a communicating channel between said inner end and said outer end of said axial chamber.

4,106,700

SUPPORT FOR SPRAYER BOOMS

Otho A. Clark, Rte. 1, Independence, Mo. 64050

Filed Feb. 22, 1977, Ser. No. 770,787
Int. Cl.[2] B05B *1/20*
U.S. Cl. 239—168 **9 Claims**



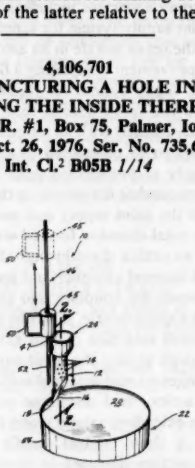
1. A sprayer including:
a mobile frame;
a boom assembly having an elongated main section and an elongated outer section,
said sections being normally in end-to-end relationship and provided with a pivot interconnecting their proximal ends for limited up and down swinging movement of the outer section relative to the main section;
a pair of elongated, horizontally spaced members having normally vertical, longitudinal axes in parallel relationship, the members being vertically reciprocable along said axes thereof;
an attachment on each member respectively securing the same to the main section for maintaining the longitudinal axes of the members perpendicular to the longitudinal axis of the main section;
a yieldable device for each member respectively disposed to cushion downward movement thereof; and
a mounting for each member respectively securing the same to the frame and restraining movement of the main section relative to said frame to only rectilinear, normally vertical reciprocation transversely of the longitudinal axis of said main section, whereby to appreciably reduce the amount of up and down pitching of the outer section about said pivot as the frame traverses uneven terrain,
said frame including a spar disposed above said boom assembly, there being a flexible member extending between said spar and said outer section for limiting downward swinging movement of the latter relative to the frame.

4,106,701

DEVICE FOR PUNCTURING A HOLE IN A CAN AND WASHING THE INSIDE THEREOF

Larry O. Siefken, R.R. #1, Box 75, Palmer, Iowa 50571

Filed Oct. 26, 1976, Ser. No. 735,606
Int. Cl.[2] B05B *1/14*
U.S. Cl. 239—271 **9 Claims**



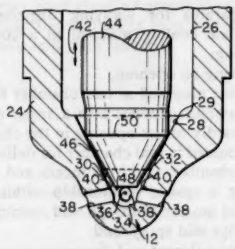
1. A device for puncturing a hole in a can and washing the inside of the can comprising,
an elongated nozzle having opposite ends, one of said ends having a pointed portion for puncturing a hole in a can and the other end having an opening for communication with a liquid source, said one end having spray openings for spraying the inside of a can and said pointed portion being offset from the axial center of said nozzle,
a striking surface on the other end of said nozzle offset from the axial center of said nozzle to expose said opening, and said pointed portion and said striking surface being substantially coplanar and being parallel to the axial center of said nozzle,
an elongated guide standard connected to said nozzle and extending parallel to said nozzle, and
a weight movably positioned on said guide standard for being driven against said striking surface to drive said pointed end of said nozzle through the wall of a can.

4,106,702

FUEL INJECTION NOZZLE TIP WITH LOW VOLUME TAPERED SAC

John W. Gardner, Chillicothe; William A. Grgurich, and Albert B. Niles, both of Peoria, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 19, 1977, Ser. No. 788,870
Int. Cl.[2] F02M *61/10*; B05B *1/30*
U.S. Cl. 239—533.3 **9 Claims**



1. In a fuel injector, the combination of:
a hollow nozzle having a spray tip with a stepped, interior conical surface defined by first and second generally frusto-conical surfaces sharing a common base which defines a circular juncture with the second frusto-conical surface being steeper than the first frusto-conical surface, said spray tip further including an interior, partially rounded surface extending from the minor base of said second frusto-conical surface;
at least one injection opening in said nozzle at the spray tip thereof; and
a reciprocal valve within said nozzle and having a frusto-conical valve tip which in a closed position of the valve is seated against said first frusto-conical surface at the major base of said frusto-conical valve tip, said frusto-conical valve tip being less steep than said first frusto-conical surface and terminating in a blunt end which in said closed position is disaligned with said injection opening at the edge thereof remote from the spray tip, the area of said blunt end being a major portion of the cross-sectional area of said interior surface at said edge whereby said valve tip in said closed position occupies substantially the entire volume within said interior surface between said edge and said circular juncture, said reciprocal valve being movable to an open position in which the major base of said frusto-conical valve tip is at a level adjacent the major base of and radially within said first frusto-conical surface, the circular juncture of said first and second frusto-conical surfaces defining an annular control edge on the nozzle which, in cooperation with the frusto-conical surface of the valve tip, defines the minimum fuel flow area therebetween in the open position of the valve, said blunt end being disposed adjacent said circular juncture in said open position, said partially rounded surface comprising a

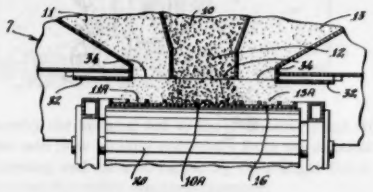
spherical surface, each said injection opening being located on the radius of said spherical surface.

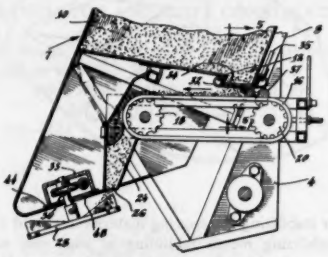
4,106,703

COMPACT LAWN SPREADER CAPABLE OF MIXING AND WIDELY SPREADING MULTIPLE LAWN TREATMENT MATERIALS

Robert J. Magda, Morganville, N.J., assignor to Lawn Doctor, Inc., Wickatunk, N.J.

Filed Mar. 7, 1977, Ser. No. 775,167
Int. Cl.[2] A01C 7/06
U.S. Cl. 239—656 22 Claims





16. An improved spreader cart for mixing and distributing material, said cart being of the type including a frame with a base and sidewalls, a plurality of bins for storing said material, said bins being supported on said frame, a rotating belt positioned below said bins for receiving material from said bins thereon, means for rotating said belt, a hopper positioned below one end of said belt for receiving said material carried on said belt, a rotating spinner positioned to receive said material from said hopper, and means for rotating said spinner,

the improvement comprising:

a plate positioned adjacent to said base of said frame,

means for pivotably mounting said plate on said base for pivotal motion with respect thereto,

means for connecting said rotating spinner to said plate,

said means for connecting said rotating spinner to said plate including a connecting member positioned therebetween,

an arcuate slot carried on said base for receiving said connecting member,

said arcuate slot defining the path traversed by said member when said plate is pivoted on said base of said frame,

the extent of said pivotal motion of said plate being defined by the length of said arcuate slot,

means on said plate for receiving said connecting member such that said pivotal motion of said plate is transmitted to said spinner by said connecting member,

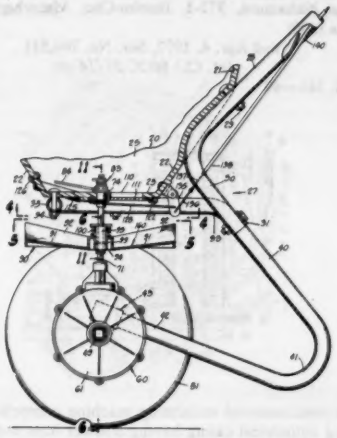
whereby the position of said plate and said spinner connected thereto is adjustable with respect to said base by pivoting said plate along said arcuate slot.

4,106,704

SPREADER (BROADCAST)

John W. McRoskey; Leonard H. McRoskey, both of Los Angeles, and Delbert D. Swartz, Sebastapol, all of Calif., assignors to Republic Tool & Manufacturing Corp., Los Angeles, Calif.

Filed Jan. 21, 1977, Ser. No. 760,967
Int. Cl.[2] A01C 17/00
U.S. Cl. 239—685 10 Claims



1. A spreader of the class described, comprising:

(a) a hopper adapted to contain a granular material to be applied to a surface;

(b) a feed opening through which said granules are discharged from said hopper;

(c) a metering gate for closing or opening said feed opening;

(d) operating means for said metering gate, including a spring connected to said hopper and said metering gate for exerting a pull on said metering gate to close same; and

(e) an operating member connected to said spring and said metering gate whereby a pull on said operating member will transfer the pulling force to said spring without said force being transmitted through said metering gate.

9. A spreader of the class described, comprising:

(a) a hopper adapted to contain a granular material to be applied to a surface;

(b) a feed opening through which said granules are discharged from said hopper;

(c) a metering gate for closing or opening said feed opening;

(d) operating means for moving said metering gate between closed and opened positions;

(e) wheel and axle means for rendering said spreader portable over the surface to be treated, said axle being rotated when said spreader is moved over said surface;

(f) a vertical shaft positioned below said hopper;

(g) an impeller mounted on said shaft and being rotatable to broadcast the granular material passing downward from said feed opening; and

(h) a preassembled drive unit adapted to be mounted, as a separate preassembled unit, in said spreader, said drive unit including:

(1) a housing having a chamber into which the lower end of said shaft extends,

(2) a driven gear in said housing, and attached to said shaft,

(3) a drive gear in said housing, said drive gear meshing with said driven gear in order to rotate said shaft to rotate said impeller,

(4) bearing means in said housing for supporting said drive gear to rotate on a substantially horizontal axis,

(5) said unit being positioned below said hopper with the

upper end of said shaft positioned as previously stated whereafter said axle is extended through an axial opening in said drive gear for driving same, and

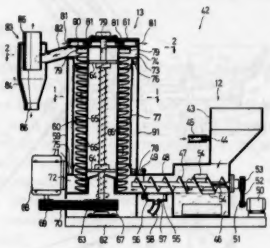
(6) said unit being centralized by said vertical shaft and said unit being supported on said axle so as to be axially movable thereon.

4,106,705

RESIN MATERIAL RECLAIMING MACHINE

Kensaku Nakamura, 272-1, Bessho-Cho, Matsubara, Osaka, Japan (580)

Filed Apr. 4, 1977, Ser. No. 784,511
Int. Cl.² B02C *23/14*
U.S. Cl. 241—49 **2 Claims**



1. A resin material reclaiming machine comprising an upstanding cylindrical casing having a lower inlet and an upper outlet, a cylindrical filter means housed in said cylindrical casing spaced inwardly therein and extending from said inlet to said outlet, and an impeller means including a plurality of impelling blades rotatably mounted coaxially in said filter means along the axis thereof, being adapted to blow wet pieces of resin material from said inlet upwardly to said outlet thereby to dehydrate said pieces within said filter means during the upward blowing operation of said impeller means, a discharging impeller means mounted on the upper end of said impeller and adapted to discharge said pieces of material to the outside through the outlet of said cylindrical casing, and an air inlet formed in the portion of said cylindrical casing positioned over said discharging impeller, a cyclone separator mounted adjacent the upper portion of said cylindrical casing and in communication with the outlet of said casing, and a plurality of second cleaning means each consisting of a centrifugal blower and a second cyclone separator mounted in communicating relation with said cyclone separator, feed hopper means for said upstanding cylindrical casing mounted on the upper portion of a case having screw conveyor means therein, a feed pipe for supplying cleaning water to said hopper means, and an opening formed in the bottom of said case below said screw conveyor, and a dehydrating mesh netting stretched on said opening.

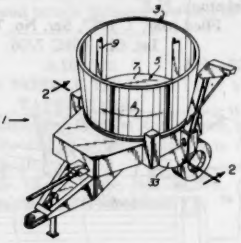
4,106,706

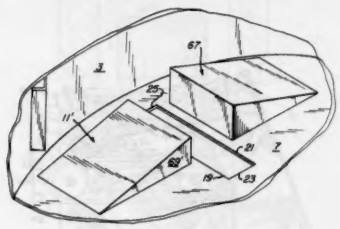
ROTARY TUB GRINDER

Harvey Paul Burrows, 1633 26th Ave. Ct., Greeley, Colo. 80631

Filed Aug. 1, 1977, Ser. No. 820,441
Int. Cl.² B02C *13/06, 13/286*
U.S. Cl. 241—186.2 **48 Claims**

1. In a tub grinder having a stationary floor member and a tub member mounted for rotation relative thereto about a first axis, said floor member having an upper surface with an opening therethrough and said tub member being mounted with at least a portion thereof extending above said upper surface of the floor member and with said first axis of rotation substantially perpendicular to said upper surface, said tub grinder further having a ramp member mounted on and extending above said upper surface of said floor member adjacent one side of the opening therethrough and a grinding means mounted for rotation about a second axis, said second axis being located below said upper surface of the floor member, said grinding means having a plurality of grinding elements, said grinding elements moving along a closed path as said grinding means is rotated about said second axis, a first portion of said closed path extending through said opening in said floor member and above said upper surface whereby material on said floor member within said rotating tub member is moved over the upper surface of said floor member and part of the material is moved up said ramp member into said first path portion of the closed path of said plurality of grinding elements, the improvement including:





means for stabilizing the moving material near said opening, said stabilizing means including at least one stabilizer member and means for mounting said at least one stabilizer member on said upper surface of said floor member adjacent a second side of said opening with said at least one stabilizer member extending above the upper surface of said floor member, said first and second sides of said opening being substantially opposite each other across said opening.

4,106,707

FEED DISTRIBUTOR FOR GYRATORY CRUSHER

Robert H. Kemnitz, Appleton, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Jun. 17, 1977, Ser. No. 807,559
Int. Cl.² B02C *2/06*
U.S. Cl. 241—202 **7 Claims**

1. In a crusher having a frame which supports a crusher mantle head for gyratory movement and a stationary concave surrounding the crusher mantle, the mantle and concave defining an annular crushing chamber therebetween, a feed distributor comprising:

support means carried by the frame;

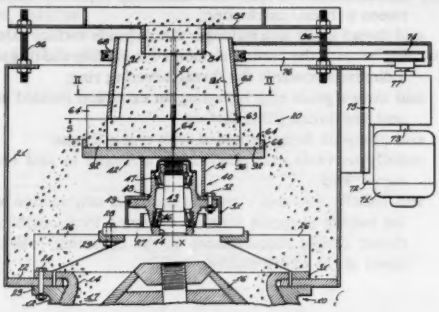
a circular material distributor plate carried by said support means for rotation independently of the movement of the crusher head;

a frusto conical material bin having an opening therethrough supported by said distributor plate in coaxial relationship above the surface thereof and positioned to define a circumferential opening between the bottom of the bin and the top surface of the distributor plate;

a material hopper means supported above said frusto conical

material bin, said hopper having a discharge spout coaxial with said bin for supplying material to said bin; and,

power drive means operably connected to effect the simultaneous rotation of said material bin and said distributor plate;



whereby the material fed to the distributor plate from said bin will flow radially outwardly from the circumferential opening and be distributed by centrifugal force evenly around the entire crushing chamber.

4,106,708

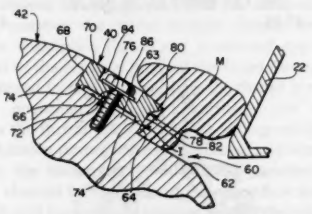
GRANULATOR AND KNIFE CONSTRUCTION THEREFOR

Gomer E. Kropa, North Reading, Mass., assignor to Leesona Corporation, Warwick, R.I.

Filed Apr. 11, 1977, Ser. No. 786,669

Int. Cl.[2] B02C *13/02, 18/18*

U.S. Cl. 241—222 **11 Claims**



1. A knife construction adapted for operative positioning with respect to a granular-to-rotor having a plurality of cut out portions laterally extending along spaced peripheral chords thereof to form continuous longitudinally extending seats each having a flat base portion along said chord and an upstanding shoulder at an inner terminus thereof for abutting receipt of said knife, said knife comprising an upstanding heel portion adapted to engage said seat shoulder, a base portion adapted to engage said seat base, a top surface opposite said base portion, and a generally hook-shaped blade face portion opposite said heel portion, said face portion having an outwardly extending cutting blade disposed above an undercut supporting segment thus forming a pocket for receipt of plastic material cut by said blade from a larger body of thermoplastic plastic material, said base portion including at least one relatively narrow downwardly directed, longitudinally extending foot portion adapted to engage the forward edge of said seat base, and means disposed through said top surface for receiving holding means to force said foot portion into high pressure sealing relationship engagement with said seat base, said base portion including an upwardly rearwardly extending cut out portion disposed adjacent said foot portion so as to concentrate such force at said foot portion.

4,106,709

METHOD OF AND APPARATUS FOR SERVING HELICAL COILS WITH A PROTECTIVE BAND

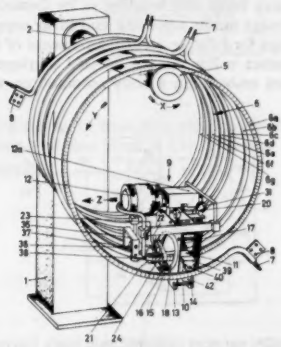
Theodor Ortmanns, Simmerath; Heinz Apelt, Roetgen, both of Germany, and Helmut Packes, Kettenis, Belgium, assignors to Otto Junker GmbH, Simmerath, Germany

Filed Jul. 13, 1976, Ser. No. 704,781

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1975, 2534198

Int. Cl.[2] H01B *13/08;* **H01F** *41/04;* **B65H** *81/02*

U.S. Cl. 242—7.03 **43 Claims**



1. A method of serving helical induction coils of large diameters and including a multitude of axially adjacent convolutions with at least one protective band using a serving device of the type including a housing having an advancement axis, a serving ring mounted on the housing for rotation about the advancement axis, and at least one payout reel for the protective band mounted on the serving ring for shared rotation therewith about the advancement axis and also for individual rotation about a support axis radially offset from the advancement axis, the method comprising the steps of mounting the induction coil for rotation about a coil axis so that the latter extends substantially horizontally; supporting the housing on an inner surface of a respective convolution to be served and at a lowermost region of the induction coil so that the advancement axis coincides with the elongation of the respective convolution; setting the induction coil in rotation about the coil axis so that the respective convolution advances at a predetermined speed in a predetermined longitudinal direction; rotating the serving ring about the advancement axis so that the protective tape is paid out from the payout reel and served onto the respective convolution; and advancing the housing in the direction of the advancement axis at substantially the same speed as but in an opposite direction than those of the respective convolution.

4,106,710

WINDING MACHINES WITH CONTACT ROLLER CONTROL DEVICE

Heinz Schippers; Erich Lenk; Manfred Mayer; Hans-Jochen Busch, and Hermann Bremer, all of Remscheid, of Germany, assignors to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Wuppertal, Germany

Filed Jun. 14, 1976, Ser. No. 695,784

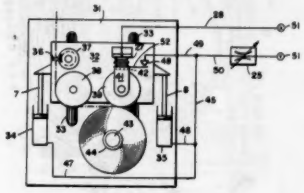
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1975, 7518741[U]; Jun. 12, 1975, 7518742[U]; Jul. 18, 1975, 2532165; Jul. 18, 1975, 2532169; Oct. 7, 1975, 2544733

Int. Cl.[2] B65H *54/02, 54/52, 67/04*

U.S. Cl. 242—18 R **19 Claims**

1. A winding machine for winding synthetic threads on a winding tube to form a winding package comprising a rotatable chuck for holding said winding tube in winding position,

thread traversing means for traversing the thread being wound on said package, a contact roller maintained in frictional contact with said winding tube and the winding thereon, said contact roller being mounted by a roller support member in a carriage, means mounting said carriage on the winding machine for vertical linear movement of said carriage and the contact roller, and means for maintaining substantially constant pressure between said contact roller and said winding, said means embodying pneumatic cylinder-piston means in a pneumatic control system for supporting the vertically movable carriage, pneumatic control means in said pneumatic system for retracting said carriage and said contact roller upwardly away from said winding as its diameter increases, and force storage means mounting said roller support member in said carriage for relative vertical movement of said member and said contact roller relative to said carriage, said force storage means embodying a body mounted on said carriage



above said roller support member, said body having fluid-tight chamber means pressurized with air and having a flexible, vertically movable, membrane wall, and connecting means rigidly joining said vertically movable membrane wall and said roller support member, the air pressure in said chamber being such that most of the weight of the support member and the contact roller is borne by the air-pressure-supported membrane wall and a desired contact pressure is provided between the contact roller and the winding formed on the winding tube, whereby, as the diameter of the winding progressively increases, said air-pressure-supported membrane wall is moved upwardly from its normal position until the carriage begins to move upwardly in response to activation of said pneumatic control means, whereupon said membrane wall begins to move downwardly under the weight of the roller support member and the contact roller mounted thereon toward the normal position of the membrane wall.

4,106,711

CHUCK FOR A TUBE ACTING AS A PACKAGE SUPPORT

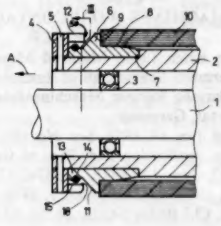
Heinz Oswald, Winterthur, and Olivier Wüst, Seuzach, both of Switzerland, assignors to Rieter Machine Works Ltd., Winterthur, Switzerland

Filed Nov. 10, 1977, Ser. No. 850,226

Claims priority, application Switzerland, Dec. 31, 1976, 16503/76

Int. Cl.[2] B65H *75/32*

U.S. Cl. 242—19 **8 Claims**



1. A chuck device for a tube serving as a package support for textile threads, comprising:

chuck means;

a thread severing ring provided with protruding tooth-shaped cutting elements;

a thread guide ring;

said thread severing ring and thread guide ring being mounted on said chuck means so as to define therebetween a thread catch zone;

said thread guide ring having a thread guide surface extending beneath the cutting elements for guiding the thread in a direction towards the thread severing ring;

said thread guide ring including an extension located adjacent the thread guide surface;

said extension being provided with recess means;

radially movable clamping means arranged in said recess means; and

said radially movable clamping means in conjunction with the cutting elements forming clamping locations for the thread caught therebetween at the operating rotational speed of the chuck means.

4,106,712

DEVICE FOR CONTROLLING THE TENSION OF YARN UNWINDING FROM A YARN SUPPORTING BODY

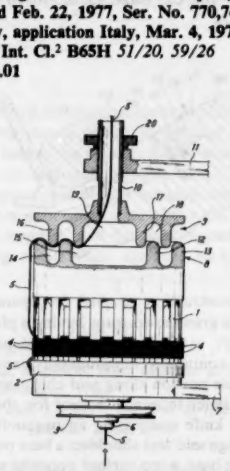
Ermanno Savio; Sergio Calamani, and Eugenio Turri, all of Milan, Italy, assignors to SAVIO e C. S.p.A., Milan, Italy

Filed Feb. 22, 1977, Ser. No. 770,744

Claims priority, application Italy, Mar. 4, 1976, 20865 A/76

Int. Cl.[2] B65H *51/20, 59/26*

U.S. Cl. 242—47.01 **4 Claims**



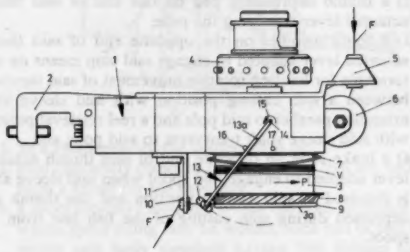
1. A device for controlling the tension of yarn unwinding from a yarn bearing body, particularly from a yarn storing and supplying apparatus, wherein: the device comprises two discs facing each other and coaxial with said yarn bearing body, to which one of said discs is integral, the other disc being provided with an axial hole passing therethrough for the passage of the yarn of which the tension has been controlled, said other disc being supported on a fixed bracket; the discs being defined by opposite faces so that at least one of the discs has at least one annular recess coaxial therewith and the other disc is provided with an annular projection coaxial therewith, the surface of said annular projection being substantially complemental with that of said recess for positioning said projection.

4,106,713

THREAD FEEDER FOR TEXTILE MACHINES

Kurt Arne Gunnar Jacobsson, Ulricehamn, Sweden, assignor to Aktiebolaget IRO, Ulricehamn, Sweden

Filed May 3, 1977, Ser. No. 793,254
Claims priority, application Fed. Rep. of Germany, May 12, 1976, 2621014
Int. Cl.² B65H 51/20
U.S. Cl. 242—47.01 9 Claims



1. In a thread delivery device for a textile machine having a drum which can be set in rotation and on which a thread issuing from a thread bobbin can be wound tangentially for forming an intermediate thread storage, said drum having a thread removal edge over which the thread can be withdrawn tangentially from the drum for permitting positive thread delivery, a thread guiding member stationarily positioned radially outside of the drum approximately at the level of the removal edge, said thread guiding member being engaged with the thread as withdrawn tangentially from the drum over the removal edge thereof, and a thread control element disposed for engagement with the withdrawn thread at a location disposed between its engagement with the drum and the thread guiding member, the thread control element being engaged with the withdrawn thread and positioned approximately at the level of the removal edge of the drum during withdrawal of the thread from the drum when the thread is subjected to a normal operating tension, comprising the improvement wherein the thread control element is disposed in the path of the withdrawn thread as it extends radially outwardly from the drum to the stationary thread guiding member, said thread control element being mounted for movement transversely of said path and transversely relative to the removal edge of said drum, and means for urging the thread control element and the withdrawn thread engaged therewith to move transversely of said path toward a position disposed below the plane of the removal edge when the tension in the withdrawn thread falls below said normal operating tension.

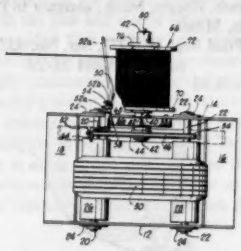
4,106,714

WIRE REELING APPARATUS

Harlo W. Janzen, Rte. 2, Box 74, Balko, Okla. 73931

Filed Jul. 18, 1977, Ser. No. 816,267
Int. Cl.² B65H 75/00, 79/00
U.S. Cl. 242—54 R 27 Claims

1. An apparatus for reeling up wire comprising:
at least one drive roller;
a reel shaft adapted to support a wire reel for rotation therewith;
a flexible driving member interconnecting the drive roller and reel shaft;
means for selectively preventing rotation of said reel shaft, and
control handle means including:
brake means selectively engageable with said flexible driving member upon pivotation of said control handle in one direction; and



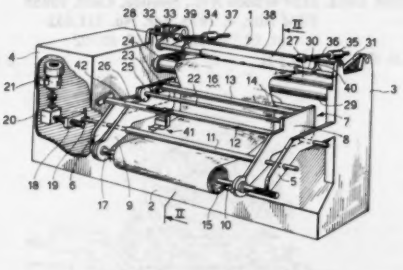
tensioning means for tensioning said flexible member upon pivotation of said control handle means in a second direction.

4,106,715

ROLLING-UP MACHINE FOR LENGTHS OF CLOTH DESTINED FOR COLLAR-CUTTING MACHINES

Luigi Pisani, Cilavegna (Pavia), Italy, assignor to Officina Meccanica Pisani Luigi, Pavia, Italy

Filed Mar. 8, 1977, Ser. No. 775,473
Claims priority, application Italy, Mar. 22, 1976, 21416 A/76
Int. Cl.² B65H 25/26
U.S. Cl. 242—57.1 4 Claims



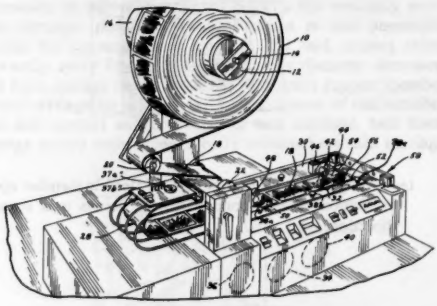
1. A rolling-up machine for lengths of cloth destined for collar-cutting machines, comprising a rolling-up bar, means to drive said bar, a cloth-drawing roll, means to drive said roll, a mobile frame carrying fixed stretching bars and a bar carrying the cloth to be rolled up, the said mobile frame being able to move transversally to the direction of unrolling of the cloth and continuously align the profile of one of the edges of the cloth roll corresponding to the head of the roll formed on the rolling-up bar, a cloth-stretching roll spaced from and parallel to the said cloth-drawing roll and rotating in the same direction; a pair of idler bars seated below the said stretching roll on the said mobile frame; these idler rolls being pressed one against the other so as to press the cloth passing therethrough and cause a relative transverse sliding motion between the stretching roll and the cloth as a result of the movement of the mobile frame in response to variations of the width of the cloth as detected by sensitive means, the interaction of the stretching roll with the pair of idler bars being capable of cancelling any undulation in the cloth and maintaining the edge of the cloth perfectly straight and well aligned with the feed path.

4,106,716

PAPER DRIVE MECHANISM FOR AUTOMATIC PHOTOGRAPHIC PAPER CUTTER

Robert E. Diesch, Rogers, Minn., assignor to Pako Corporation, Minneapolis, Minn.

Filed Sep. 29, 1977, Ser. No. 837,987
Int. Cl.[2] B65H 25/22
U.S. Cl. 242—75.43 **14 Claims**



1. A paper drive system for a photographic paper cutter, the paper drive system comprising:

paper supply means for supplying a strip of photographic print paper;

guide means for guiding the strip along a path; and

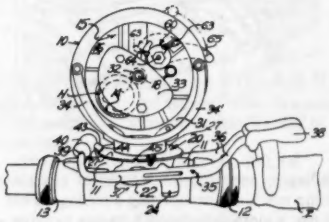
paper drive means proximate a first edge of the strip for driving the strip along the path by applying a driving force to the strip only at the first edge.

4,106,717

LATCHING MEANS FOR A FREE SPOOL RETRIEVAL AND SPIN TYPE CASTING REEL

Ralph Thiel, 1129 Wanda Ave., Seaside, Calif. 93955

Filed Aug. 4, 1976, Ser. No. 711,432
Int. Cl.[2] A01K 89/015, 89/02
U.S. Cl. 242—84.2 B **3 Claims**



1. A fishing reel for use of a fishing pole said reel being convertable from a fixed spool casting reel to a free spool retrieval reel comprising in combination:

(1) a pole mount;

(2) a turntable pivotally secured to said pole mount;

(3) a gear housing secured to said turntable radially of the pivotal center thereof;

(4) a gear arrangement within said housing;

(5) means on said gear housing for turning said gear arrangement;

(6) a sleeve shaft having one end secured to said gear housing and extending therefrom radially of and above said pivotally mounted turntable;

(7) a spool journaled for free rotation on said sleeve shaft;

(8) a drive shaft journaled as a free floating axle within said sleeve shaft and adapted to have drive connection with said gear arrangement within said gear housing;

(9) means at the free end of said drive shaft for connecting the latter to said spool;

(10) stop means on said turntable at right angles relative to each other, one below the free end of said drive shaft diametrically opposite said gear housing and the other at 90° therefrom;

(11) a thumb actuated lever pivotally mounted on said pole mount on an axis transverse of the pole;

(12) a thumb depressable pad on one end of said thumb actuated lever overlying the pole;

(13) a tooth member on the opposite end of said thumb actuated lever adapted to engage said stop means on said turntable for limiting rotative movement of said turntable between a spin casting position with said sleeve shaft extending parallel to said pole and a reel retrieval position with said sleeve shaft transverse to said pole; and

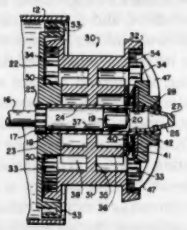
(14) a brake shoe on opposite end of said thumb actuated lever adapted to engage said spool when said sleeve shaft is disposed in spin casting position and the thumb pad depressed during spin casting of the fish line from the spool.

4,106,718

SPINNING REEL SPOOL AND ADAPTER THEREFOR

Robert T. Catignani, Fort Lee, N.J., assignor to The Garcia Corporation, Teaneck, N.J.

Continuation of Ser. No. 85,620, Oct. 30, 1970, abandoned, which is a continuation of Ser. No. 746,936, Jul. 23, 1968, abandoned. This application Jan. 6, 1977, Ser. No. 757,208
Int. Cl.[2] A01K 89/01
U.S. Cl. 242—84.2 R **6 Claims**

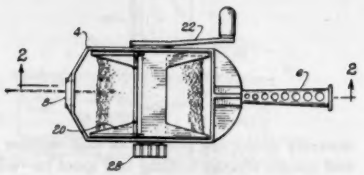


1. For use with a spinning reel having a spindle, a rotatable bail carrier disposed about said spindle, and a bail on said bail carrier to engage and wind line, a disengageable spindle adapter having a longitudinally symmetrical spool removably mounted thereon comprising, in combination, a spindle adapter having a tubular shaft sized to slide over the spindle of said reel, a base extending laterally outward from said tubular shaft, means fixing said tubular shaft against rotation about said spindle, and means disengageably securing said tubular shaft on said spindle, said tubular shaft having a forwardly disposed threaded end remote from said base; a longitudinally symmetrical spool having line pre-wound thereon, a cylindrical body and two larger diameter shoulders at the ends of said body, said body containing a central opening to receive the tubular shaft of said spindle adapter; a peripheral, forwardly extending flange on said base of said spindle adapter and surrounding the rearwardly disposed shoulder of said spool to substantially fill the annular space between the rearwardly disposed shoulder of said spool and said bail carrier; a nut turned about the threaded end of said tubular shaft to adjustably resist rotation, said longitudinally symmetrical spool being reversible on said adapter to accomodate right and left hand reels; and click means to indicate rotation of said spool about said spindle said clicking means comprises annular teeth on the ends of said spool and a spring member mounted on said adapter engaging the annular teeth on the rearwardly disposed end of said spool.

4,106,719
REEL ASSEMBLY FOR KITE LINES AND THE LIKE

Joseph G. Haverland, 516 Tallow Ct., Chula Vista, Calif. 92011

Filed Apr. 7, 1977, Ser. No. 785,387
Int. Cl.[2] B65H 75/30, 75/40
U.S. Cl. 242—96 3 Claims

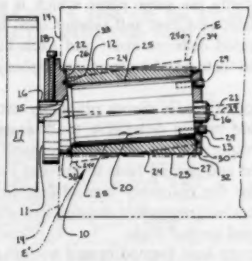


1. In a reel assembly the combination of:
a. dual oppositely disposed body members that are united to form a frame for the assembly;
b. a spool rotatably mounted within the body members upon which spool string may be wound, each end of said spool within said body members having four flanges formed thereon for retaining said string therebetween, one of said ends having an axial, outwardly-directed extension which has a cylindrical outer surface and an outwardly tapered inner surface;
c. a crank with handle for rotating the spool integrally formed on the end of the spool opposite the end having said extension; and
d. frictional brake means and means on said frame for mounting said brake means for turning movement, said brake means having a tapered surface which cooperates with the tapered surface on said extension when said brake means is turned on its mounting on said frame to wedge said extension against said frame to control the resistance to force applied to the string on the spool.

4,106,720
EXPANDABLE INTERNAL CHUCK

George Elwood Reeder, Jr., 10739 Mississippi Blvd., Coon Rapids, Minn. 55433

Filed Dec. 3, 1976, Ser. No. 747,464
Int. Cl.[2] B65H 75/24
U.S. Cl. 242—68.4 28 Claims

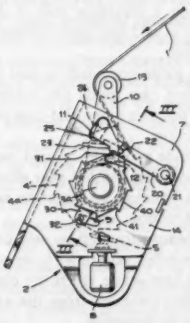


1. An expandable internal chuck for holding an item in a machine by expansion of the chuck within the item, comprising
(a) an internal hub having
(1) a central axis,
(2) means for mounting of the hub to a machine, and
(3) an external radial bearing having an axis at an acute oblique angle to the central axis of the hub;
(b) a sleeve mounted upon the radial bearing and rotatable with respect to the hub and having
(1) an outer cylindrical surface, and
(2) an inner journal positioned at an acute oblique angle to the outer cylindrical surface, said journal being closely fitted on said bearing; and
(c) means for retaining the sleeve rotatably mounted upon the hub, with the hub and sleeve having
(1) a non-expanded first position with respect to one another wherein the sleeve outer cylindrical surface is substantially concentric with the hub central axis, and
(2) an expanded position in which the sleeve is rotated on and with respect to the hub from the first position to a second position in which the sleeve outer cylindrical surface is at an acute oblique angle to the hub central axis thereby expanding the effective diameter of the chuck for holding an item placed upon the chuck.

4,106,721
SAFETY BELT RETRACTOR WITH DUAL TENSION RETRACTION MEANS

Charles J. Ulrich, Montecito, Calif., assignor to American Safety Equipment Corporation, Encino, Calif.

Continuation of Ser. No. 627,875, Oct. 31, 1975, abandoned.
This application Feb. 17, 1977, Ser. No. 769,682
Int. Cl.[2] A62B 35/02; B65H 75/48
U.S. Cl. 242—107 14 Claims

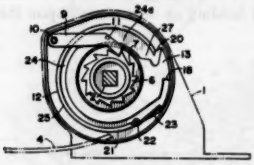


13. A safety belt retractor having a frame, a webbing storage means mounted on said frame and biased toward a webbing stored condition under a first tension applied by a first spring means and a safety belt webbing connected to said storage means and having webbing portions to be stored thereby, comprising:
means for relieving the webbing of said first tension applied thereto by said first spring means through said storage means; and
means mounted on said frame for applying a second lower tension upon said webbing through said webbing portions when the first tension of said first spring means is relieved, wherein
means are provided for reapplying the first tension of said first spring means upon said webbing through said storage means in response to a movement of said webbing beyond a predetermined amount under the influence of said means for applying a second lower tension.

4,106,722
DEVICE FOR PREVENTING EXCESSIVE TIGHTNESS OF SEATBELTS

Mitsuo Inukai, Nagoya, and Yoshihiro Hayashi, Kasugai, both of Japan, assignors to K. K. Tokai Rika Denki Seisakusho, Japan

Continuation-in-part of Ser. No. 762,574, Jan. 26, 1977, abandoned. This application Mar. 24, 1977, Ser. No. 780,832
Claims priority, application Japan, Mar. 26, 1976, 51-37045
Int. Cl.[2] A62B *35/02*; B65H *75/48*
U.S. Cl. 242—107.7 4 Claims



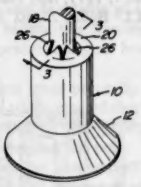
1. A seat belt retractor comprising:
a frame;
a seat belt takeup spool rotatably coupled to said frame;
a means for applying a rotational torque to said spool in a winding up direction;
a seat belt wound on said spool;
at least one ratchet gear coupled to said spool;
a pawl pivotally coupled to said frame and engageable with said ratchet gear such that the spool is prevented from winding up said seat belt when said pawl engages with said ratchet gear;
a cam plate frictionally coupled to said ratchet gear and rotatable therewith;
a first cam guide provided on said cam plate for guiding said pawl in such a direction that it disengages from said ratchet gear as said cam plate rotates in a direction of seat belt extension;
a second cam guide provided on said cam plate continuous with said first cam guide for holding said pawl in said disengaged position when said cam plate rotates in a winding up direction;
a third cam guide provided on said cam plate for engaging said pawl with said ratchet gear after said guide plate has rotated in a winding up direction and then rotates in an extending direction; and
a switching means provided on said cam plate which automatically switches said pawl from said first cam guide to said second cam guide when the direction of rotation of said cam plate switches from the extending direction to the winding up direction.

4,106,723
SPOOL FOR THREAD OR THE LIKE

Paul A. Couture, Stroudsburg, Pa., assignor to Holland Thread Co., Stroudsburg, Pa.

Filed Aug. 26, 1977, Ser. No. 828,134
Int. Cl.[2] B65H *75/12, 49/36*
U.S. Cl. 242—118.3 9 Claims

1. A spool for holding thread, said spool comprising:
a base and a substantially cylindrical portion with a bore passing therethrough, said spool being mountable over a spindle with said spindle passing through said spool bore; and
means for retaining said spool on said spindle, said means comprising a radially scored member mounted across said bore whereby said member breaks along said score lines when the spool is placed over the spindle causing radially

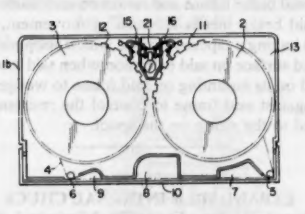


inwardly projecting portions of said member to engage said spindle thereby holding said spool on said spindle.

4,106,724
TAPE CASSETTE

Yutaka Higashida, Nishinomiya, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 28, 1977, Ser. No. 791,776
Claims priority, application Japan, May 4, 1976, 51-56270[U]
Int. Cl.[2] G11B *23/10*
U.S. Cl. 242—198 3 Claims



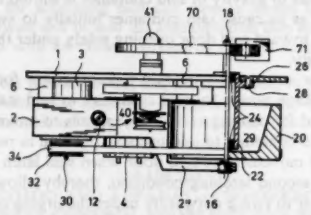
1. A tape cassette for use in a magnetic recording and reproducing apparatus provided with a brake release pin located parallel to and near a pair of reel engaging shafts comprising:
a housing including a bottom plate;
first and second tape reels rotatably mounted in said housing in substantially the same plane which is parallel to said bottom plate, said first and second reels being spaced a predetermined distance apart and each having a flange portion and teeth provided on the periphery of said flange portion;
first and second brake pieces pivotably mounted in said housing and having respective tooth engaging end portions for respective removable engagement with the teeth of said first and second reels to prevent rotation thereof;
biasing means for pivotably biasing said first and second brake pieces into respective engagement with said teeth of said first and second reels;
a single through-hole formed in said bottom plate; and,
a brake releasing means including an operating arm normally covering the entire area of said through-hole, said brake releasing means being pivotable by pushing pressure exerted on said operating arm by said brake release pin immediately prior to engagement of said shafts with said first and second reel, said brake releasing means further including a mechanism for engaging with said first and second brake pieces upon pivotal movement of said brake releasing means to pivot said brake pieces against the biasing force of said biasing means and away from respective engagement with said teeth on said first and second reels.

4,106,725

DRIVE UNIT FOR MAGNETIC TAPE-RECORDERS

Oskar Hubert Richt, Buchenweg 14, Soecking, Fed. Rep. of Germany

Filed Dec. 16, 1976, Ser. No. 751,347
Int. Cl.[2] G03B 1/04; G11B 15/32
U.S. Cl. 242—201 14 Claims



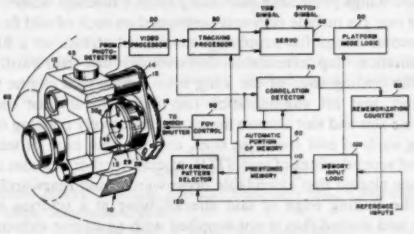
1. A drive unit for a magnetic tape-recorder comprising two driving spindles for moving the magnetic tape, a drive wheel associated with each driving spindle, a single drive motor rotatable in two opposite directions and in constant driving connection with the two drive wheels, and respective clutch means between each driving spindle and the associated drive wheel, each clutch means comprising a clutch lever pivotally mounted on the associated drive wheel and rotatable therewith, a cam disc cooperating with the clutch lever, the cam disc being rotatable relative to the drive wheel and defining two alternative pivotal positions for the lever, and a projection rotatable with the driving spindle and positioned so as to be engaged by the clutch lever when in only one of said pivotal positions, each clutch means being effective automatically to establish a torque connection between the associated drive wheel and driving spindle when the motor rotates in a respective one of said directions and to interrupt such torque connection when the motor rotates in the other said direction, and said cam disc being shaped so as to enable the clutch means to interrupt the existing torque connection to one spindle before establishing the torque connection to the other spindle.

4,106,726

PRESTORED AREA CORRELATION TRACKER

David L. Emmons, Orlando; Richard E. Roberts, Winter Park; Edward Pasko, Orlando, and George Lamar Harmon, Winter Park, all of Fla., assignors to Martin Marietta Corporation, Orlando, Fla.

Filed Nov. 4, 1969, Ser. No. 873,864
Int. Cl.[2] F41G 7/00; F42B 15/02
U.S. Cl. 244—3.17 25 Claims



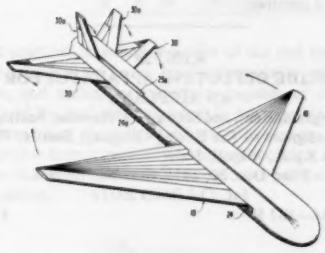
1. Apparatus for determining angular misalignment between a desired aim point and an actual aim point of a missile or other vehicle, comprising memory means for prestoring at least three related signals representing the appearance of the aim point area at an initial range and at successively closer ranges to such aim point, scanning means for generating a current signal indicative of the area about the actual aim point, and means for sequentially utilizing the prestored signals in determining angular misalignment between the current signal and the memory signals.

4,106,727

AIRCRAFT FOLDING AIRFOIL SYSTEM

Alexander Rudolph Ortell, Huntsville, Ala., assignor to Teledyne Brown Engineering, a Division of Teledyne Industries, Inc., Huntsville, Ala.

Filed May 9, 1977, Ser. No. 795,052
Int. Cl.[2] B64C 3/56
U.S. Cl. 244—49 10 Claims



1. A foldable airfoil comprising

a plurality of elongated channels each having one end forming a portion of the root area of the airfoil and an outer end opposite said root end,

means for pivotally mounting said root end of each of said plurality of channels on a support base at spaced intervals along the root dimension of said airfoil for pivotal motion of each channel in the plane of the airfoil,

each said channel having a cross sectional shape nestably containable within the cross sectional envelope of the next adjacent of the pivotally mounted channels, and

means interconnecting the outer ends of each of said plurality of channels for rotational movement of said plurality of channels about their respective root end pivots between (1) an extended position in which the lengthwise dimension of each said channel extends spanwise of the airfoil with portions of adjacent channels overlying and (2) a retracted position in which said plurality of channels are colinear in alignment with the channel root end pivots and the cross sectional area of each of said channels is nestably contained within the envelope of the cross section of an adjacent channel, said interconnecting means including means nestingly containing said outer end of each of said plurality of channels within the envelope of the next adjacent channel in said extended position and during movement between said extended and retracted positions.

4,106,728

FAIL SAFE FORCE FEEL SYSTEM

Carl D. Griffith, Phoenix, Ariz., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Jan. 17, 1977, Ser. No. 760,045
Int. Cl.[2] B64C 13/04
U.S. Cl. 244—83 D 10 Claims

1. A force feel apparatus for aircraft flight controls comprising

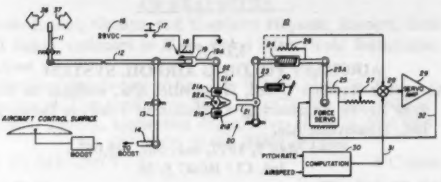
a manual control member for operating an aircraft attitude control surface through a boost actuator,

a variable artificial feel force gradient spring means,

a force servosystem connected to said spring means responsive to aircraft motion for varying the force gradient of said spring means, and

non-linear linkage means connected between said spring

means and said manual control member for transmitting control member motions to said spring means and for



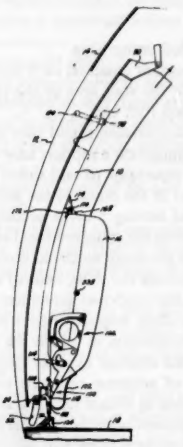
inhibiting motion of said spring means to said manual control member.

4,106,729

ESCAPE SLIDE DEPLOYING APPARATUS FOR USE IN AN AIRPLANE

Burton Bergman, Kent, and Stewart M. Herman, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash. and Aeritalia S.p.A., Napoli, Italy

Filed Dec. 30, 1976, Ser. No. 755,838
Int. Cl.[2] B64D *25/14*
U.S. Cl. 244—137 P **17 Claims**



1. In combination with a door and means mounting said door for upward and downward movement relative to a substantially horizontally oriented floor and into and out of engagement with a door opening in a wall associated with said floor, said movement being between a closed position adjacent said floor and in engagement with said door opening and an open position spaced upwardly from said floor and said door opening, said door having inner and outer sides, an improved apparatus for deploying an escape slide container normally attached to said door, said container having a center of gravity, comprising:

a movable member and support means operatively associated with said floor adjacent the bottom of said door opening, said support means being constructed to allow upward movement of said movable member relative to said floor,

latch means operatively associated with said movable member, said latch means and said door having a first latching condition for securing said movable member to said door and releasing said movable member from said support means and a second latching condition for securing said movable member to said support means and for releasing said movable member from said door,

linkage means for coupling said container to said movable member, said linkage means and said movable member being so constructed and associated with each other to mount said container for outward swinging movement relative to said door opening, said linkage means being so constructed as to hold said container in a stable position wherein said container will remain in a position located above said movable member, said linkage means capable of moving said container to an unstable position wherein the center of gravity of said container is shifted to a location so as to cause said container initially to swing outwardly toward said door opening solely under the urging of gravity,

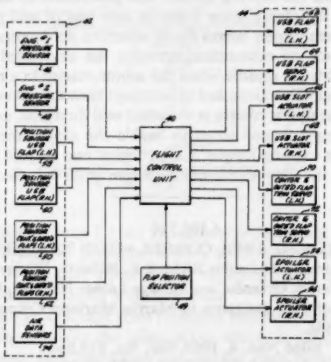
trip means associated with said linkage means for locking said linkage means to hold container in said stable position, and for causing said linkage means to move so as to shift said container to said unstable position in reaction to upward movement of said door when said latch means is in said second latching condition, thereby allowing said container to swing outwardly under the urging of gravity to position said container adjacent said door opening in readiness for deployment of an escape slide held by said container.

4,106,730

ENGINE OUT CONTROL SYSTEM FOR STOL AIRCRAFT

Robert E. Spitzer, Seattle, and Fred W. May, III, Bellevue, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Oct. 1, 1976, Ser. No. 728,742
Int. Cl.[2] G05D *1/12*
U.S. Cl. 244—183 **23 Claims**



1. In an STOL aircraft including first and second oppositely disposed wings projecting outwardly from a fuselage wherein at least one gas turbine engine is positioned on each of said first and second wings for supplying an exhaust stream to a lift augmentation flap extendable downwardly and rearwardly from the trailing edge of the wing upon which said engine is mounted, said lift augmentation flap including at least one spanwise slot and slot closure means for selectively opening or closing each of said spanwise slots, and wherein each of said first and second wings of said STOL aircraft further includes at least one slotted flap extendable downwardly and rearwardly from the trailing edge of said aircraft wing at a position in which said slotted flap is not supplied with an engine exhaust stream from said engine supplying said exhaust stream to said lift augmentation flap, an automatic control system for activating said lift augmentation flaps and said slotted flaps when said STOL aircraft effects a landing maneuver with one engine in an inoperative state wherein the thrust supplied by that engine is less than a predetermined thrust level, said automatic control system comprising:

engine failure detection means for detecting said inoperative state of one of said gas turbine engines;

means responsive to said engine failure detection means for extending that lift augmentation flap normally supplied with an exhaust stream by said inoperative engine to a position wherein the rearward and downward extension of said lift augmentation flap corresponds to the rearward and downward extension of the slotted flap located on that wing of said aircraft including said inoperative engine;

means for activating said slot closure means to open said spanwise slot of said lift augmentation flap normally supplied with an exhaust stream by said inoperative engine; and

means for partially retracting the slotted flap of the wing not including said inoperative engine to reduce roll moment and associated drap caused by said inoperative engine.

4,106,731

METHOD AND APPARATUS TO OVERCOME AIRCRAFT CONTROL PROBLEMS DUE TO WIND SHEAR

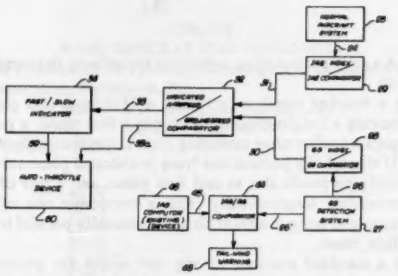
John H. Bliss, 2740 Graysby Ave., San Pedro, Calif. 90732

Continuation-in-part of Ser. No. 608,408, Aug. 29, 1975, Pat. No. 4,021,010. This application Nov. 8, 1976, Ser. No. 740,112

The portion of the term of this patent subsequent to May 3, 1994, has been disclaimed.

Int. Cl.[2] G05D *1/12*

U.S. Cl. 244—188 **8 Claims**



8. An apparatus in determining power to be applied to an aircraft engine during a landing approach, comprising

(a) first means for monitoring deviations of actual aircraft airspeed from desired approach airspeed, and deviations of actual aircraft groundspeed from desired approach groundspeed,

(b) second means coupled to said first means for providing an indication as to which of said deviations is the lower compared to the associated desired value, from which a pilot can maintain a stabilized speed condition above a safe value by adjusting engine power,

(c) and cooperating instrumentation on the aircraft and on the ground near the landing area to produce on the aircraft a Doppler frequency shifted signal indicative of actual groundspeed of the aircraft.

4,106,732

CAMPER TRAILER

Ernest Henry Whiting, 218-222 Balaclava Rd., Caulfield, Victoria, Australia (3162)

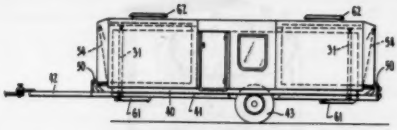
Filed Nov. 3, 1976, Ser. No. 738,295

Claims priority, application Australia, Nov. 5, 1975, PC3842; Aug. 16, 1976, PC7008

Int. Cl.[2] B60P *3/32*

U.S. Cl. 296—23 C **3 Claims**

1. A camper trailer comprising a base having upstanding sides and a top having a roof and sides depending from the roof; wherein the top is raisable from a lowered position in which the sides of the base and top are telescoped one within the other to a raised position in which the sides of the base and the top are in at least substantially untelescoped condition; wherein the top includes a first member having depending sides and which is open at one end and an end member having a roof portion, depending sides and a depending end wall and wherein the end member is movable generally horizontally from a retracted position, in which the sides of the end member and said first member are telescoped one within the other, to an



extended position, in which the sides of the end member and said first member are in at least substantially untelescoped condition, and including a platform capable of closing the underside of the end member when in the extended position, the platform being pivotally attached to the camper trailer and being movable from a generally horizontal position, in which it closes the underside of the end member, to a generally vertical stored position.

4,106,733

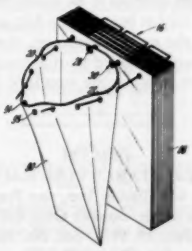
BAG DISPENSER AND HOLDER

Charles Richard Walitalo, Matteson, Ill., assignor to Union Carbide Corporation, New York, N.Y.

Filed Mar. 29, 1977, Ser. No. 782,390

Int. Cl.[2] B65B *67/04*

U.S. Cl. 248—100 **14 Claims**

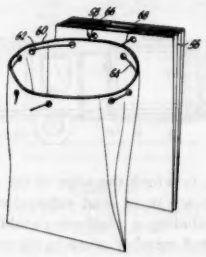


1. A bag dispenser and support holder comprising a brace member having a pair of deformable, resilient, outwardly extending spaced-apart support members, said support member comprising inner segments for supporting a plurality of bags proximal the brace member through a pair of spaced-apart holes in the mouth of the bags, and curved opposed outer segments which are aligned in a common plane to define a substantial, open hoop-type configuration; said brace member having at least one outwardly extending hook-wicket intermediate said extending pair of support members adapted for further supporting the plurality of bags through holes in said bags intermediate the pair of spaced-apart holes; and said support members being operable such that when a bag is advanced from the inner segments it will apply a sufficient force to slightly collapse the curved segments so as to accommodate the spacings of the support holes in the mouth of the bag and once the bag is fully advanced on the curved segments and supported on the at least one hook-wicket, said curved segments will exert an outwardly applied tensive force on the mouth of the bag sufficient to maintain the mouth of the bag in an open position.

4,106,734
BAG DISPENSER AND HOLDER

Charles Richard Walitalo, Matteson, Ill., assignor to Union Carbide Corporation, New York, N.Y.

Filed Mar. 29, 1977, Ser. No. 782,387
Int. Cl.[2] B65B 67/04
U.S. Cl. 248—100 15 Claims

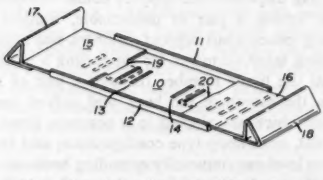


1. A bag dispenser and support holder comprising a brace member having a pair of outwardly extending, spaced-apart support members adapted for supporting a plurality of bags having holes in the mouth of said bags; a first deformable, resilient, substantially arcuate member extending from the end of one of said spaced-apart support members; a second deformable, resilient, substantially arcuate member extending from the end of the other of said spaced-apart support members; and said deformable, resilient substantially arcuate members being outwardly and oppositely aligned in a common plane to define a substantial, open hoop configuration, said arcuate members being operable such that as a bag is advanced from the support members, the bag will apply a sufficient inward force on the arcuate members to slightly collapse the arcuate members such that their extremities overlap so as to accommodate the spacing of the support wicket holes in the bag and once the bag is fully advanced on the arcuate members, the arcuate members will exert an outwardly applied tensive force on the mouth of the bag sufficient to maintain the mouth of the bag in an open position.

4,106,735
ADJUSTABLE COIL RACK

Wilbur A. Partain, 415 Illinois Ave., and Frank D. Sudol, 1124 Logan Ave., both of Mc Donald, Ohio 44437

Filed Jun. 13, 1977, Ser. No. 805,828
Int. Cl.[2] B60P 7/00
U.S. Cl. 248—119 R 4 Claims

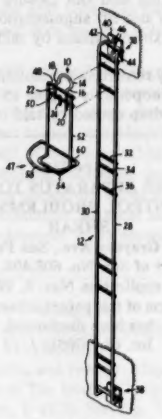


1. An adjustable coil rack for the anti-rolling support of steel coils comprising a flat rectangular body member having upstanding longitudinally extending flanges on its longitudinal edges, said body member having a plurality of spaced transversely extending slot-like apertures axially thereof and inwardly of the ends thereof and a pair of secondary flat body members having offset tongues on one of each of of their ends engaged in two of said slot-like apertures so that said offset tongues underlie portions of said flat rectangular body member to secure said secondary body members in spaced relation on said flat rectangular body member, upstanding abutments on the opposite ends of each of said secondary body members.

4,106,736
ARTICLE SUPPORTING APPARATUS

Frederick R. Becker, III, Dallas, and Charles W. Nicely, Wilkes-Barre, both of Pa., assignors to Metropolitan Wire Corporation, Wilkes-Barre, Pa.

Filed Jan. 3, 1977, Ser. No. 756,397
Int. Cl.[2] A47F 5/01
U.S. Cl. 248—222.2 12 Claims



1. An article supporting apparatus comprising the combination of:

(a) a bracket member including a U-shaped clip portion having a longitudinal axis lying in a first plane, a pair of parallel offset arms extending from respective ends of said U-shaped clip portion and lying in a second plane substantially perpendicular to said first plane, and a pair of legs extending longitudinally from a respective one of said arms and lying in a third plane substantially parallel to said first plane;

(b) a standard member having rod means for preventing lateral movement of said legs, said rod means including an elongated pair of laterally spaced apart rods, and at least two longitudinally spaced apart transverse bars connected to rear sides of said rods to accommodate and retain said bracket member;

(c) article support means coupled to said legs of said bracket member;

(d) the longitudinal spacing between said bars being less than longitudinal length of said clip portion to provide for a part of said clip portion being retained behind one of said bars when said arms sit on the other of said bars in a retained position; and

(e) the lateral spacing between said rods being slightly greater than width of said bracket member to receive said legs therein, said rods lying in said third plane in said retained position with said legs positioned inwardly of and adjacent to said rods to prevent said lateral movement of said legs.

4,106,737
BOAT BRACKET

Roy L. Arnett, 278 Morningview Ave., Akron, Ohio 44305

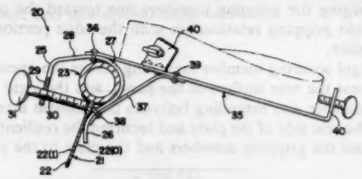
Filed Mar. 28, 1977, Ser. No. 781,566
Int. Cl.[2] A47F 5/00
U.S. Cl. 248—226.4 3 Claims

1. A bracket for use on an open boat having a hull with a tubular gunwale,

said bracket comprising a deformable strap having inner and outer ends and a medial portion adapted for conforming engagement with the upper and outer surfaces of said tubular gunwale,

said strap being fabricated from a rectilinear elongated strip having a substantially uniform cross-section throughout the extent thereof from end to end,

said strap inner end having an inverted L-shape providing a span portion extending laterally inward of said medial portion and downwardly projecting terminal portion, said terminal portion having a tapped bore therein for receiving the threads of a rotatable bolt projecting through said bore for adjustable engagement with the inner surface of said hull beneath said tubular gunwale,



said strap outer end being in engagement with the outer surface of said hull beneath said tubular gunwale,

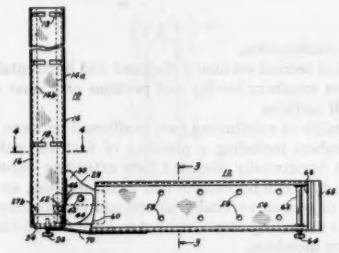
there being an elongate load carrying base member integrally attached to and extending laterally outward of said strap medial portion.

4,106,738

BASE BRACKET FOR SHELVING

James F. Kostecky, Bethlehem, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Jul. 27, 1977, Ser. No. 819,315
Int. Cl.[2] A47B *96/06*
U.S. Cl. 248—235 **1 Claim**



1. In combination with an upright, said upright having a vertical slot therein and mutually aligned holes passing through said upright whereby the mutual axis of said holes is perpendicular to said slot, a bracket comprising:

(a) a main body comprising a hook and heel member, said hook being characterized by a notch one wall of which is adapted to engage a first portion of a surface of said upright after said hook passes through said vertical slot, said hook being provided with a hole that is aligned with the holes in said upright when said hook is properly positioned with respect to said upright,

(b) a tab rotatably secured to said heel member, said tab being characterized by a notch one wall of which is adapted to engage a second portion of said surface of said upright after said tab passes through said vertical slot, said tab being provided with a hole that is aligned with the holes in said upright and the hole in said hook when the notch in said tab engages said upright, and

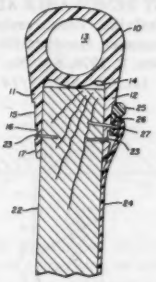
(c) a pin adapted to pass through the holes in said upright, said hook, and said tab whereby said bracket is secured to said upright.

4,106,739

BUMPER EDGE MEMBER FOR CHAIRS

George E. Gasser, 6455 Sodom-Hutchings Rd., Girard, Ohio 44420

Filed May 19, 1977, Ser. No. 798,646
Int. Cl.[2] A47B *95/00*
U.S. Cl. 248—345.1 **6 Claims**



1. A bumper edge member for chairs and the like which have structural portions defining perimeter edges, the edge member comprising:

a continuous resilient member having an elongate body portion and a pair of spaced flanges extending outwardly from said body member, said flanges being located on said body member to receive therebetween a structural portion of a chair;

a first cushioning means defined in said body member, said first cushioning means including a hollow chamber defined in said body member to be located between said flanges in front of an edge of such structural portion;

a second cushioning means defined in said body member to be located between said flanges; and

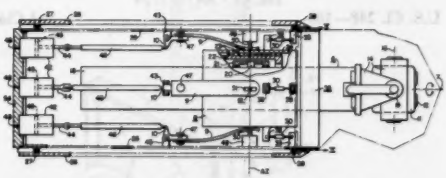
said second cushioning means being positioned in said body member to be located between a chair structural portion edge and said first cushioning means.

4,106,740

AIRBORNE VIBRATION ISOLATED SENSOR APPARATUS

Wayne B. Lloyd, Baltimore, and Dale R. Logan, Columbia, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 28, 1977, Ser. No. 782,278
Int. Cl.[2] F16F *15/04*
U.S. Cl. 248—358 R **7 Claims**



1. Airborn vibration isolated sensor apparatus comprising:

an elongated hollow enclosure means for external mounting on an aircraft;

an elongated sensor assembly disposed substantially within said enclosure means with access to information arriving externally;

a plurality of elongated leaf springs extending longitudinally of said sensor assembly in distribution therearound;

said leaf springs being supported by said enclosure means

and supporting said sensor assembly by creation of yieldable flexural forces;

linkage means for introducing flexure to said leaf springs selectively; and

actuator means for operating said linkage means selectively.

4,106,741

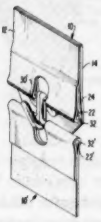
TWO COMPONENT REMOVABLE ADHESIVE HANGER

James W. Hogg, Nashville, Tenn., assignor to Anchor Wire Corporation of Tennessee, Goodletsville, Tenn.

Filed Nov. 8, 1976, Ser. No. 739,938

Int. Cl.[2] A47F 7/14

U.S. Cl. 248—467 **16 Claims**



1. A two component removable adhesive hanger for hanging an object on a wall or like surface comprising:

(a) a hook member support component;

(b) a hook member supported by said hook member support component; and

(c) a backing sheet component of fibrous, water dissolvable material adhesively bonded to the hook member support component by a first adhesive, said backing sheet component having a water activated and water dissolvable second adhesive on the side which is affixed to the wall or like surface wherein the bonds created by said first and second adhesives are of greater strength than that of the fibrous material such that upon removal of said hook member support component from said backing sheet component, a portion of the backing sheet component remains attached to said hook member support component and a portion remains attached to said wall or like surface, which portion attached to said wall is dissolvable upon contact with water.

4,106,742

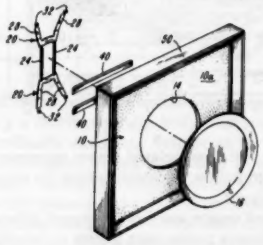
DECORATIVE PLATE MOUNTING ASSEMBLY

Emil E. Miller, and Stella Maye Miller, both of 1652 Brown St., Dayton, Ohio 45409

Filed Jan. 14, 1977, Ser. No. 759,391

Int. Cl.[2] A47G 1/24

U.S. Cl. 248—488 **4 Claims**



1. A decorative plate and mounting assembly comprising a decorative plate having a front side and a rear side,

a panel having a front surface and a rear surface with an opening extending therethrough, the decorative plate being positioned adjacent the front surface of the panel and covering the opening with the front side of the plate facing away from the front surface of the panel,

a set of gripping members adjacent the rear side of the plate and having parts engaging the front side of the plate at spaced-apart edge portions thereof,

a resilient member connecting the gripping members and urging the gripping members one toward the other and into gripping relationship with the edge portions of the plate,

a rigid securing member extending across the opening adjacent the rear surface of the panel, and the rigid securing member also extending between the resilient member and the rear side of the plate and securing the resilient member and the gripping members and the plate to the panel.

4,106,743

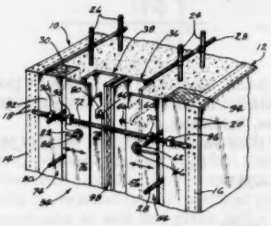
ADJUSTABLE BULKHEAD FOR CONCRETE WALL FORMS

Dennis W. Dendinger, R.R. #1, Hartington, Nebr. 68739

Filed Oct. 27, 1977, Ser. No. 845,873

Int. Cl.[2] E04G 11/06

U.S. Cl. 249—34 **6 Claims**



1. In combination,

first and second vertically disposed and horizontally spaced form members having end portions and inner and outer wall surfaces,

a plurality of reinforcing bars positioned between said form members including a plurality of first vertically spaced and horizontally disposed bars extending outwardly beyond the end portions of said form members, and a plurality of second vertically spaced and horizontally disposed bars extending outwardly beyond the end portions of said form members,

a plurality of vertically spaced tie bars secured to the end portions of said first and second form members and extending therebetween,

a first vertically disposed elongated member positioned at the inner wall surface of said first form member adjacent the end portion thereof,

a second vertically disposed elongated member positioned at the inner wall surface of said second form member adjacent the end portion thereof,

connection means securing said first and second elongated members to said tie bars,

first and second vertically disposed angle members mounted on said tie bars adjacent said first and second elongated members respectively,

first and second vertically disposed channel members secured to said first and second angle members,

second connection means horizontally adjustably securing together said first channel member and said first angle member,

third connection means horizontally adjustably securing together said second channel member and said second angle member,

said second and third connection means permitting relative horizontal movement between said first and second chan-

nel members and said first and second angle members respectively to provide an adjustable bulkhead for concrete placed between said form members,

said first reinforcing bars extending outwardly beyond said first form member between said first elongated member and said first angle member,

said second reinforcing bars extending outwardly beyond said second form member between said second elongated member and said second angle member.

4,106,744

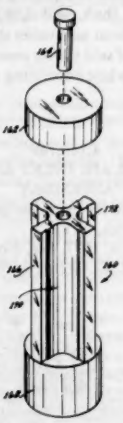
MANDREL FOR FORMATION OF MASS SPECTROMETER FILTER

James L. Lawrence, Jr.; Robert A. Holzl, both of La Canada, and Frederick P. Pickett, Sierra Madre, all of Calif., assignors to Analog Technology Corporation, Irwindale, Calif.

Division of Ser. No. 612,551, Sep. 11, 1975, abandoned, which is a continuation of Ser. No. 768,174, Feb. 14, 1977. This application Feb. 14, 1977, Ser. No. 768,172

Int. Cl.² B29C *1/00*

U.S. Cl. 249—96 **13 Claims**



1. A male mandrel for use in forming a mass filter for use in a mass spectrometer, comprising:

(a) a cylindrical portion extended along a common axis, having constant cross section, and having axially-extending electrode-defining surfaces which comprise the surfaces of a plurality of axially extending valley regions in said cylindrical portion, each valley region, including both its bottom and its sides, being outwardly concave and arcuate over the greater portion of its surface; terminated at its first end by an integral end surface perpendicular to the common axis;

(b) a shank portion integral with said cylindrical portion having plane surfaces disposed perpendicular to the common axis for terminating said cylindrical portion at the end opposite its first end;

(c) an end piece, having a plane surface large enough to cover the entire end surface of said cylindrical portion, for mounting on said cylindrical portion with its plane surface held tightly against the end surface of said cylindrical portion.

(d) means for positioning the said end piece in contact with the first end of said cylindrical portion.

4,106,745

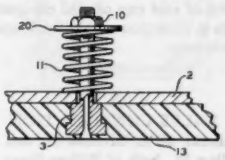
APPARATUS FOR ATTACHING AN INSERT IN A MOLD

Guy E. Carrow, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 357,662, May 7, 1973, abandoned. This application Apr. 1, 1975, Ser. No. 564,090

Int. Cl.² B22D *19/00*

U.S. Cl. 249—97 **3 Claims**



1. An apparatus for molding an object that is to have an insert embedded therein comprising an insert, a mold having a hole in the mold wall where said insert is to be positioned, an extension of said insert extending through said hole to the exterior of the mold when said insert is in its proper position within the mold, a spring means attached to the part of said extension which extends outside the mold wall such that said insert is spring biasly held in its correct position within the mold, said hole in said mold wall being of sufficient size with respect to the portion of said extension extending through said hole in said mold wall to allow the insert to have sufficient freedom of movement to move laterally as well as axially in response to shifting or contracting of the molded object which will occur during cooling of the molded object, and wherein said insert is smaller than the hole in the mold wall and at least a portion of said insert is prevented from passing through the mold wall by a washer-like means located between the insert and the interior of the mold.

4,106,746

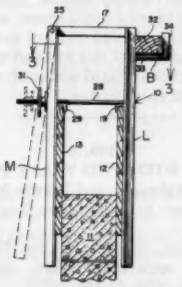
ADJUSTABLE FORM CLAMP

Umberto A. Baculo, 231 NW. 59th Ct., Miami, Fla. 33126

Filed May 19, 1977, Ser. No. 798,633

Int. Cl.² E04G *17/12*

U.S. Cl. 249—216 **1 Claim**



1. An adjustable beam clamp comprising a pair of elongated leg members in spaced and substantially parallel relation to each other, a cross member secured at one end to the upper end portion of one of said elongated leg members and extending in the direction of the other of said elongated leg members, pivot means mounting the other end of said cross member to the upper end portion of said other of said elongated leg members, an angle bar secured to an inner surface of said one of said elongated leg members, said angle bar having leg portions extending horizontally and downwardly for receiving the top

edge of a board forming one side of a concrete form, a threaded rod secured to said angle bar at one end and its threaded end extending beyond said other of said elongated leg members, nut means threadedly mounted on said threaded rod adapted to engage and cause said other of said elongated leg members to pivot about said pivot means, a second angle bar secured to the lower surface of said threaded rod, said second angle bar having leg portions extending horizontally and downwardly for receiving the top edge of a board forming the other side of said concrete form and bracket means mounted on said upper portion of said one of said elongated leg members and extending in a direction away from said other of said elongated leg members.

4,106,747

VALVE CONSTRUCTION

Joseph J. Malacheski, 28 E. Division St., and Edward A. Stelmack, 199 Willow St., both of Wilkes-Barre, Pa. 18702

Filed Dec. 16, 1976, Ser. No. 751,070
Int. Cl.[2] F16K *25/00*
U.S. Cl. 251—84 **8 Claims**

1. A valve construction comprising a seat, a stem having one end facing toward said seat, threaded stem mounting means mounting said stem for simultaneous axial spiral rotation and longitudinal shifting toward and away from said seat, a washer at said one end of said stem, washer mounting means mounting said washer for shifting movement with said stem toward and away from bearing engagement with said seat and rotation relative to said stem, and separable interfitting formations on said seat and washer movable into and out of engagement with each other upon washer movement toward and away from said seat for holding said washer against rotation upon washer movement into said bearing engagement, said interfitting formations comprising an annular array of teeth on each of said seat and washer, said teeth of said seat and washer respectively tapering in the directions toward said washer and seat to assure meshing engagement therebetween.

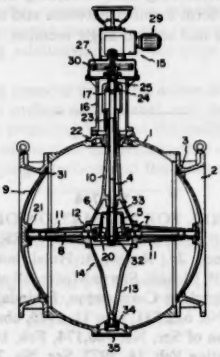
4,106,748

VALVE WITH TWO VALVE PLATES

Yasukazu Niino, Kitakyushu, and Takuya Nagai, Nogata, both of Japan, assignors to Nishinippon Engineering Co., Ltd., Fukuoka, Japan

Filed Sep. 28, 1976, Ser. No. 727,499
Claims priority, application Japan, Aug. 25, 1976, 51-114218[U]; Aug. 25, 1976, 51-114219[U]
Int. Cl.[2] F16K *31/02*
U.S. Cl. 251—133 **12 Claims**

1. A valve with a pair of valve plates comprising a valve casing having two communicating ports, a pair of valve plates disposed in said valve casing for closing said communicating ports, a valve shaft mounted on said valve casing, a valve-shaft actuating mechanism mounted on said valve casing for operating said valve shaft, and a valve-plate acutating mechanism operably connected between said valve shaft and said valve plates for transforming the movement of said valve shaft to the movement of said valve plates such that the latter are pivotably movable about the axis of said valve shaft and displaceable along an axis perpendicular to the axis of said valve shaft, said valve-plate actuating mechanism comprising a shifter casing, said shifter casing having a first portion disposed generally coaxial with the axis of said valve shaft and a second portion disposed generally perpendicular to the axis of said valve shaft, and operable means disposed within said shifter casing operably connecting said valve shaft and said valve plates, said valve shaft actuating mechanism comprising a sleeve rotatably disposed about said valve shaft, said first portion of said shifter casing being disposed about said valve shaft, said sleeve engaging said upper portion of said shifter casing to preclude relative rotation therebetween while permitting relative axial displacement therebetween.

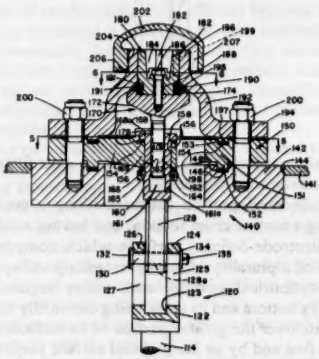


4,106,749

BOTTOM OPERABLE AIR INLET AND OUTLET VALVE ASSEMBLY

Gunter R. Behle, St. Charles, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Jan. 5, 1977, Ser. No. 757,121
Int. Cl.[2] F16K *51/00*
U.S. Cl. 251—144 **17 Claims**



1. An air inlet and oulet valve assembly for a railway tank car comprising:

a valve member mounted within an opening in the top of a railway tank car; an operating shaft extending from the bottom of the car, through the tank to the top of the tank to operate the valve; said operating shaft including shaft rotating means located at the bottom of the tank to raise and lower said valve member; and shaft telescoping means comprising at least one fork; said fork including a pair of vertically extending arms each having a vertical slot therein such that the upper part of the operating shaft is

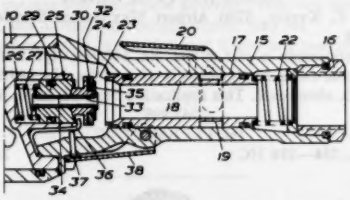
movable vertically within said slots relative to the lower portion of the shaft, as the top of the tank moves relative to the bottom of the tank; whereby when the car is impacted and the top of the tank moves downwardly relative to the bottom of the tank the upper portion of the operating shaft will move downwardly within said slots, and the valve will remain closed during such impacts; and whereby said valve member may be opened and closed from the bottom of the car by means of said shaft rotating means and said operating shaft.

4,106,750

SAFETY VALVE FOR PNEUMATIC TOOLS

Karl Gösta Kårdén, and Karl Gustav Berger, both of Nacka, Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Nov. 2, 1976, Ser. No. 738,279
Claims priority, application Sweden, Nov. 6, 1975, 7512433
Int. Cl.² F16K *39/00*
U.S. Cl. 251—282 **18 Claims**



1. A safety valve for pneumatic tools, comprising:
a first movable valve member (18) manually shiftable between a closed position and an opened position;
a second movable valve member (25) movable relative to and selectively sealingly cooperating with said first valve member (18) to selectively open and close a pressure line;
a spring (27) loading said second valve member (25) in the opening direction of said first valve member (18), so as to maintain said sealing cooperation as said first valve member (18) is shifted toward its opened position; and
manually operable arresting means (36,37,38) coupled to said second valve member (25) to selectively lock said second valve member (25) against movement and thereby discontinue said sealing cooperation as said first valve member (18) is shifted toward its opened position, said second valve member (25) being freely movable with said first valve member (18) while maintaining said sealing cooperation when not engaged by said arresting means.

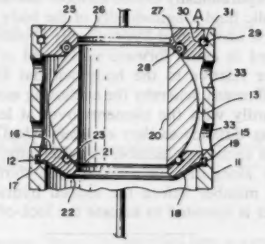
4,106,751

ROTATABLE VALVE ASSEMBLY

Shale J. Niskin, 2941 Lucaya, Miami, Fla. 33133

Continuation-in-part of Ser. No. 788,588, Apr. 18, 1977, Pat. No. 4,091,676, which is a continuation-in-part of Ser. No. 691,905, Jun. 1, 1976, Pat. No. 4,037,477. This application Aug. 15, 1977, Ser. No. 824,784
Int. Cl.² F16K *5/00*
U.S. Cl. 251—316 **4 Claims**

1. A rotatable valve assembly comprising a tubular member having a valve chamber, a ball valve having a axially disposed passageway mounted in said chamber for controlling the flow of fluid therethrough, a ledge portion mounted about said tubular member at said valve chamber, said tubular member having a peripheral groove at said ledge portion, a floating valve seat positioned in proximity of said ball valve, said valve seat being slidably mounted in said valve chamber and having a peripheral shoulder member adapted to rest on said ledge portion, a flexible diaphragm engaging said floating valve seat and having an outer edge portion interposed between said ledge portion and said peripheral shoulder, a seal mounted in said groove and securing said outer edge portion of said flexible diaphragm in said peripheral groove, a fixed valve seat mounted in said valve chamber and engaging said ball valve on a side opposite that of said floating valve seat, both of said



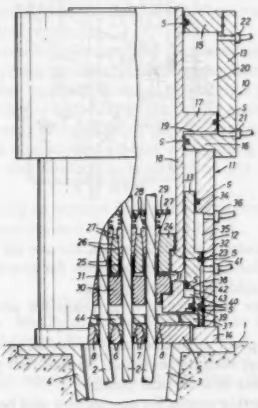
valve seats having seals engaging said ball valve with said flexible diaphragm and said valve seats having openings in alignment with said passageway in said ball valve.

4,106,752

JACK FOR STRESSING CONCRETE RE-INFORCEMENT ELEMENTS

Eduardo Caro Roqueta, Barcelona, Spain, assignor to Buildinter AG, Vaduz, Liechtenstein

Filed Dec. 6, 1976, Ser. No. 748,069
Claims priority, application United Kingdom, May 4, 1976, 18269/76; Nov. 1, 1976, 45317/76
Int. Cl.² E21B *19/00*
U.S. Cl. 254—29 A **9 Claims**



1. A hydraulic jack for stressing simultaneously a plurality of concrete reinforcement elements and for anchoring the stressed elements in an anchoring member which has apertures for the elements and anchoring wedges seating in the apertures, the jack comprising
a. a body having a front end adapted to abut on a support member during a stressing operation,
b. gripping means for gripping the elements for stressing the elements, movable longitudinally of the body towards and away from the front end,
c. lock-off means actuable to cause the anchoring wedges to anchor the stressed elements in the anchoring member,
d. a first hydraulically driven member movable by means of hydraulic fluid longitudinally of the body and operatively connected to said gripping means to cause rearward movement thereof relative to the body thereby to stress the elements simultaneously,

e. a second hydraulically driven member movable by means of hydraulic fluid longitudinally of the body and relative to said first hydraulically driven member, and arranged to actuate said lock-off means,

f. a third hydraulically driven member movable by means of hydraulic fluid longitudinally of the body and relative to said first and second hydraulically driven members, and arranged to cause forward movement of the anchoring member relative to the body without actuation of the lock-off means, whereby the anchoring member can move rearwardly with the elements over at least part of the stressing distance as they elongate when being stressed, and the anchoring member can thereafter be moved forwardly along the elements by the third hydraulically driven member before the second hydraulically driven member is operated to actuate the lock-off means.

4,106,753

AUTOMATIC ANTI-FALL DEVICE FOR POWER-DRIVEN LIFTING MACHINERY

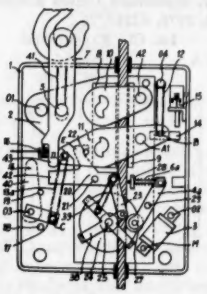
Michel Cavalieri, and Francois Batreau, both of Neuilly sur Marne, France, assignors to Europe-Levage Manutention (Elma), Bagnolet, France

Filed Jul. 26, 1976, Ser. No. 708,820

Claims priority, application France, Jul. 30, 1975, 75 23722; Dec. 24, 1975, 75 39657

Int. Cl.[2] B66D *5/04*

U.S. Cl. 254—157 **3 Claims**



1. An automatic anti-fall device, for use on a motor-driven lifting machine having a bearer cable for attachment of a load to be lifted, said device comprising

(i) a carrier structure having means for attachment of the load

(ii) a first pivot means on said carrier structure

(iii) a bearer member mounted on said first pivot means for movement in a vertical plane

(iv) connecting means for connecting said bearer member to the bearer cable

(v) a cable clamping assembly including (a) clamping means (b) control means for the clamping assembly pivotably mounted on said bearer member for movement in a vertical plane, and (c) means resiliently urging the clamping means into clamping condition,

(vi) an auxiliary safety cable positioned vertically between said clamping means

(vii) a lever pivotably mounted on said carrier structure for movement in a vertical plane,

(viii) coupling means coupling said lever to said connecting means,

(ix) resilient linking means connecting said lever to said clamping control means for holding said clamping means open when load is applied to the carrier structure,

(x) a first control for the motor of the lifting machine, said control being mounted on the carrier structure, said control being positioned in relation to said bearer member such that, upon occurrence of a predetermined extent of vertical pivoting movement of said bearer member under excessive load as well as when the load is transferred to the auxiliary safety cable, said bearer member actuates said first control to stop the motor,

(xi) resilient means connected to said carrier structure and to said bearer member and opposing vertical pivoting movement of said bearer member,

(xii) a second control for the motor of the lifting machine, said control being mounted on the carrier structure and being positioned in relation to an end portion of said connecting means such that, if the load decreases under a predetermined value, said connecting means actuates said second control to stop the motor, and

(xiii) a control lever pivoted to said carrier structure and adapted to engage said control means to urge them into a position closing said clamping means on the auxiliary cable against the action of said resilient linking means.

4,106,754

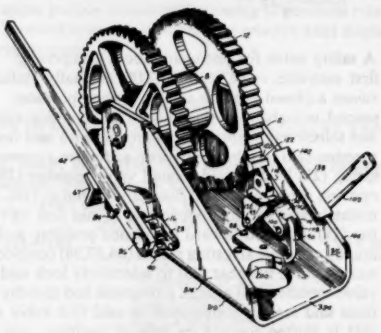
CABLE HAULING WINCH

Robert C. Kucher, 5200 Airport Way South, Seattle, Wash. 98108

Continuation-in-part of Ser. No. 349,540, Apr. 9, 1973, abandoned, and a continuation-in-part of Ser. No. 349,564, Apr. 9, 1973, abandoned. This application Nov. 15, 1976, Ser. No. 741,995

Int. Cl.[2] B66D *1/00*

U.S. Cl. 254—186 HC **26 Claims**



3. A winch for receiving a line, said winch comprising:

a. a frame comprising a first support and a second support;

b. said first support and said second support being spaced apart;

c. a drum around which said line may be wound;

d. said drum being positioned between said first support and said second support;

e. a first means for rotating said drum for winding said line onto said drum;

f. a drum gear on said drum and connecting with said first means comprising said drum;

g. said first means comprising a drive pinion operatively connecting with said drum gear;

h. a second means for rotating said drive pinion for rotating said drum gear and said drum;

i. said drum gear being mounted on said drum and defining a barrier for said line to position said line on said drum;

j. said drum having a hub;

k. a means cooperating with said hub to firmly position said line;

l. said means comprising a rotating pawl having an end juxtapositioned to said hub;

m. the spacing between said hub and said rotating pawl being sufficient to receive said line;

n. said hub being recessed to receive said line;

o. said rotating pawl having a curved recessed end juxtapositioned to said hub; and,
p. laid line upon being positioned between said hub and said curved recessed end and under tension rotating said rotating pawl to clamp said line in position.

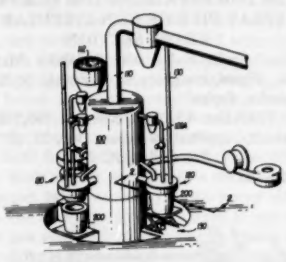
4. A winch for receiving a line, said winch comprising:
a. drum for receiving said line;
b. a frame having a base;
c. a passageway in said base;
d. a stand having a base for attaching to a support structure such as a deck;
e. said stand comprising a riser;
f. the interior dimensions of said passageway being greater than the exterior dimensions of said riser so that said frame may pass over said riser to be free to move along said riser and to rotate around said riser;
g. a cap on top of said riser;
h. said cap being of a, generally, elliptical configuration having a major axis of a greater dimenson than the dimension of said riser; and,
i. said passageway being of a, generally, elliptical configuration and having dimensions greater than the dimensions of said cap so that said frame may pass over said cap.

4,106,755

FLUIDIZED BED LADLE HEATING METHOD AND APPARATUS

William C. Dell, 1211 Conn. Ave., N.W., Washington, D.C. 20036

Continuation-in-part of Ser. No. 799,238, May 23, 1977. This application Jun. 23, 1977, Ser. No. 809,363
Int. Cl.[2] C21D *1/00*
U.S. Cl. 266—44 **14 Claims**



1. The method of high temperature heat treatment of foundry ladles comprising the steps of:
A. forming a mother fluidized bed of refractory particles capable of containing and sustaining high temperatures;
B. periodically entraining and firing a solid fuel within the mother fluidized bed to raise and sustain the temperature thereof to 1500° - 2000° F.; and
C. sequentially conducting hot refractory particles and hot gasses from the mother fluidized bed to at least one ladle to form a secondary fluidized bed within said ladle raising the temperature of the ladle to the temperature range of the mother fluidized bed, while maintaining a steady state within both said beds.

4,106,756

OXYGEN LANCE AND SENSING ADAPTER ARRANGEMENT

Nicholas M. Rymarchyk, Pittsburgh, and Leo L. Meinert, Baden, both of Pa., assignors to Pullman Berry Company, Harmony, Pa.

Filed Nov. 1, 1976, Ser. No. 737,637
Int. Cl.[2] C21C *7/00, 5/32*
U.S. Cl. 266—99 **4 Claims**

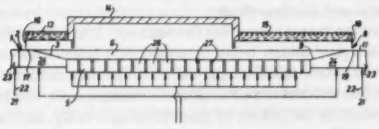
1. A gas injection lance for insertion into a vessel for processing molten metal comprising:
a nozzle head at one end adapted to be positioned proximate to the molten metal,
a plurality of concentric gas and coolant-carrying tubes at least the innermost gas-carrying tube of which is connected to the nozzle head in communication with said nozzle head for discharging gas therethrough,
a sensor-mounting support positioned within said gas-carrying tube,
a sensor mounted at one end of the sensor-mounting support proximate to and out of contact with said nozzle head and in axially spaced relation thereto and defining a gas-fillable thermal buffer zone chamber therewith,
said nozzle head serving as a primary heat shield between the molten metal and said sensor,
said buffer zone chamber, adapted for gasses therein being the sole body between the sensor and head and providing a supplemental dynamic heat shield between said nozzle head and said sensor,
said nozzle providing a constricted unobstructed passage for draining a pressurized reservoir of gasses from said buffer zone chamber, and said chamber providing a gas-enveloping replenishable heat barrier about said sensor,
and means removably mounting said sensor on the support including a sleeve portion and a mounting block fixed within the sleeve portion mounted on the end of said support,
a housing having an annular flange seated against said block, and means securing said flange to said block.

4,106,757

HOVER FURNACES

George Jackson, Sheffield, England, assignor to British Steel Corporation, London, England

Filed Feb. 4, 1977, Ser. No. 765,767
Claims priority, application United Kingdom, Feb. 17, 1976, 6188/76
Int. Cl.[2] C21D *9/54*
U.S. Cl. 266—103 **9 Claims**



1. A furnace for continuously heat treating metallic strip comprising an entry table including a leading portion having a substantially plane upper surface and a trailing portion which inclines downwardly towards the base of a floatation trough, the trough extending along substantially the full length of the heating zone of the furnace and including upwardly and outwardly inclined side walls, the furnace also comprising flow restricting means located above the upper surface of the lead-

ing portion of the entry table to define with the table surface a shallow slot sufficient to enable strip to enter the furnace.

4,106,758

CONVERTERS FOR REFINING METALS

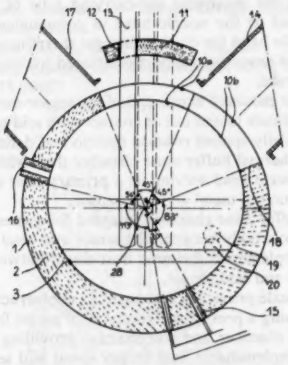
Pierre Leroy, Saint-Germain-en-Laye; André Maubon, and Jean Saleil, both of Saint-Etienne, all of France, assignors to Creusot-Loire Enterprises, Paris, France

Filed Jun. 10, 1977, Ser. No. 805,606

Claims priority, application France, Jun. 16, 1976, 76 18252

Int. Cl.[2] C21C *5/38*

U.S. Cl. 266—158 **16 Claims**



1. A converter for the refinement of liquid metal comprising:

a generally cylindrical hollow body having a horizontal axis and opening means in the circumference thereof including first and second circumferentially spaced parts;

end members closing the ends of said body;

means for supporting and rotating said body about said axis;

a refractory arch including heating means;

means for removing said arch into said first part of said opening means when said opening means is in the upper part of said body, said heating means then extending into said body;

first means for collection of gases from said body, said first gas collection means being separate from said body and mounted to be aligned with said second part of said opening means to receive gases therethrough when said first part of said opening means is positioned to receive said arch and heating means;

blast pipe means extending through and into said body, said blast pipe means being arranged in a lower part of said body when said first part of said opening means is positioned to receive said arch and heating means; and second means for collection of gases from said body, said second gas collection means being separate from said body, said first and said second gas collection means being arranged symmetrically with respect to said arch such that on rotation of said body to position said arch in said second part of said opening means said second gas collection means is aligned with said first part of said opening means, said blast pipe means being then arranged in an emerged position above or at the surface of the bath of metal in the converter body.

4,106,759

DEVICE AND METHOD FOR THE INTRODUCTION OF GASES INTO REACTION VESSELS CONTAINING LIQUIDS

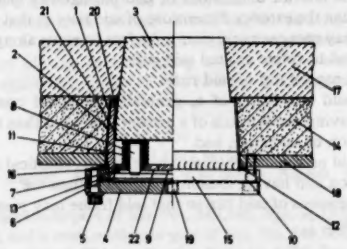
Alfred Steinegger, Venthône, and Ernst Huber, Schaffhausen, both of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Jun. 1, 1977, Ser. No. 802,527

Claims priority, application Switzerland, Jun. 1, 1976, 6835/76

Int. Cl.[2] C21C *5/48*

U.S. Cl. 266—220 **19 Claims**



1. A device for the introduction of gas, in combination comprising:

a walled reaction vessel adapted to contain liquids, such as metal melts, the vessel being exposed to thermal stresses,

a sleeve secured to the wall of the reaction vessel,

a gas-permeable inlet body of heat-resistant material fitting into said sleeve, the wall of the reaction vessel including a rigid inner layer of heat-resistant material, a loose intermediate layer of bulk material, and a casing, said sleeve extending from the exterior of said vessel into said casing, said rigid inner layer and said gas-permeable inlet body being disposed directly adjacent to one another, and

a substantially air-tight shell of ceramic material secured to a side surface of said inlet body.

4,106,760

APPARATUS FOR REPAIRING THE FURNACE LINING WITH A SPRAY PIPE OF NON-CIRCULAR HOLLOW CROSS SECTION

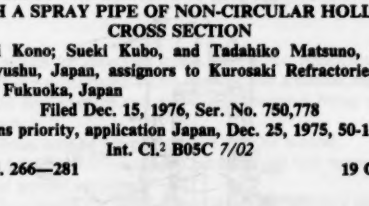
Hiroshi Kono; Sueki Kubo, and Tadahiko Matsuno, all of Kitayushu, Japan, assignors to Kurosaki Refractories Co., Ltd., Fukuoka, Japan

Filed Dec. 15, 1976, Ser. No. 750,778

Claims priority, application Japan, Dec. 25, 1975, 50-158436

Int. Cl.[2] B05C *7/02*

U.S. Cl. 266—281 **19 Claims**



1. In a apparatus for repairing the lining of a furnace with a refractory material comprising a hollow spray pipe having a uniform thickness and being defined by integral inner and outer pipe walls, said inner wall defining an unobstructed internal passageway, said refractory material contacting said inner pipe wall in passing exclusively and directly through said passageway, a rocking sleeve in which said shooting pipe is

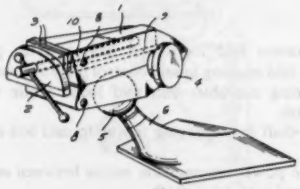
slidably disposed, a support column pivotally mounting said rocking sleeve, a sliding mechanism directly engaging said outer wall of said spray pipe for sliding said spray pipe relative to said rocking sleeve, and a rotating mechanism for rotating said sliding means about the axis of said spray pipe, said outer wall and said inner wall of said spray pipe having non-circular cross sections such that engagement of said spray pipe by said sliding mechanism precludes rotation of said shooting pipe relative to said sliding mechanism so that rotation of said sliding mechanism also rotates said spray pipe, whereby said spray pipe is manipulated without weakening the rigidity or strength thereof.

4,106,761

ELEVATED SUPPORT ANGULARLY ADJUSTABLE ON A SPHERICAL JOINT HEAD AND SAME BEARING A VISE

Carlos Morales Peregrina, Calle Floresta No. 131, Mexico 16 D.F., Mexico

Filed Feb. 18, 1976, Ser. No. 659,036
Claims priority, application Mexico, Feb. 20, 1975, 156694
Int. Cl.[2] B23Q *3/04*
U.S. Cl. 269—75 **6 Claims**



1. A vise arranged on an elevated support adapted to be capable to be brought in different angular positions and fixed therein and movable into these positions on, and carried by, a universal linking joint head elevated over a substrate base, comprising an elongate parallelopipedic bulky body composed of a pair of mating mirror-like configured halves coupled to one another at one end thereof by at least one hinging bolt, each of said halves of said bulky body forming within its lower part one half of a unitary cavity for receipt of said linking joint head formed on top of a support leg-like rod projecting upwardly from said substrate plate, said cavity being configured to mate with, and surround, said joint head, wherein said bulky body, on the side distal from that of coupling of said halves by at least one hinging bolt, comprises a tightening bolt passing through said halves and being operable from outside to either loosen or tighten the engagement between said pair of halves and thereby also between the wall of said cavity and said linking joint head for enabling, respectively, angular motions of said bulky body and its securing in a desired angular position, said support being provided on its upper side with the assembly of a vise comprising one jaw fixed to said bulky body and the other jaw unitary with an elongate holder located on, and shiftable along, rail members extending longitudinally of said bulky body, said holder and both said jaws being provided with female threads, while a matingly threaded screw bolt operable from outside passes through said jaws and said holder to enable mutual distancing and approaching of said jaws.

4,106,762

HIGH SPEED INSERT HANDLING MECHANISM AND METHOD

Hans G. Faltin, 4135 Wilshire Dr., York, Pa. 17402

Filed May 21, 1976, Ser. No. 688,538
Int. Cl.[2] B65H *39/02*
U.S. Cl. 270—54 **4 Claims**

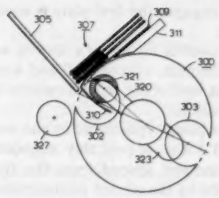
1. A high speed feeder for individually discharging products, having a long panel portion and a short panel portion folded thereover along a front edge with an extending end and the short panel portion being no longer than ½ of the long panel portion, from a source of supply comprising, in combination;

means for unfolding said products at said source;

means for individually accelerating the so unfolded products for feeding;

means forming a pathway for said products between the source and the means for accelerating;

said means for accelerating comprising at least one high speed roller and a high speed rotary drum; said means for



unfolding including means located within the rotary drum for engaging the short panel portion;

said high speed roller being mounted adjacent said drum to form a nip therewith for engaging the end of said short portion for accelerating the product thereof away from said source along said pathway;

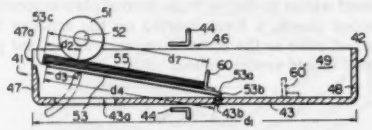
and, said nip being spaced a distance from the source of supply relative to the length of said short panel portion to permit the drum and roller to grip and pull said product out of the way of the next following product.

4,106,763

CASSETTE TYPE SHEET FEED APPARATUS FOR COPYING MACHINE OR THE LIKE

Tatsuo Tani, and Toshiaki Kameyama, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 9, 1976, Ser. No. 740,284
Claims priority, application Japan, Nov. 11, 1975, 50-135298
Int. Cl.[2] B65H *1/12, 1/23, 3/44*
U.S. Cl. 271—9 **14 Claims**



11. A cassette type sheet feed apparatus comprising:

a first sheet cassette including a bottom wall formed with a hole therethrough, a front wall and a rear wall spaced from the front wall of the first cassette by a first predetermined distance;

a feed roller rotatably supportable above the cassette and spaced from the front wall of the first cassette by a second predetermined distance which is shorter than the first predetermined distance;

an actuator intrudable into the first cassette through the hole thereof at a third predetermined distance from the front wall of the first cassette which is shorter than the first predetermined distance;

a first sheet supporting plate supported on the bottom wall of the first cassette, the first plate having a front edge substantially in alignment with the front wall of the first cassette and a rear edge spaced from the front edge of the first plate by a fourth predetermined distance which is longer than the third predetermined distance and shorter than the first predetermined distance, the rear edge of the first plate being tiltably connected to the bottom wall of the first cassette, the first plate having a first predeter-

mined width and being adapted to support a stack of identical first sheets of substantially the first predetermined width and a length which is substantially at least equal to the fourth predetermined distance and less than the first predetermined distance, the actuator being engageable with the first plate to tilt the first plate toward the feed roller so that the first sheets feedably engage with the feed roller, the fourth predetermined distance being selected so that, with the first plate supporting the first sheets, a force exerted on the actuator by the first plate as the actuator engages the first plate is equal to a predetermined value;

a second sheet cassette including a bottom wall formed with a hole therethrough, a front wall and a rear wall spaced from the front wall of the second cassette by a fifth predetermined distance;

the first cassette being replaceable by the second cassette so that the feed roller is rotatably supportable above the second cassette and spaced from the front wall of the second cassette by the second predetermined distance and the actuator is intrudable into the second cassette through the hole thereof at the third predetermined distance from the front wall of the second cassette; and

a second sheet supporting plate supported on the bottom wall of the second cassette, the second plate having a front edge substantially in alignment with the front wall of the second cassette and a rear edge spaced from the front edge of the second plate by a sixth predetermined distance which is longer than the third predetermined distance and shorter than the fifth predetermined distance, the rear edge of the second plate being tiltably connected to the bottom wall of the second cassette, the second plate having a second predetermined width different from the first predetermined width and being adapted to support a stack of identical second sheets of substantially the second predetermined width and a length which is substantially at least equal to the sixth predetermined distance and less than the fifth predetermined distance, the actuator being engageable with the second plate to tilt the second plate toward the feed roller so that the second sheets feedably engage with the feed roller, the relative magnitude of the sixth and fourth predetermined distances being dependent on the relative magnitude of the second and first predetermined widths so that, with the second plate supporting the second sheets, a force exerted on the actuator by the second plate as the actuator engages the second plate is equal to said predetermined value.

4,106,764

CARDBOARD-FEEDING DEVICE

Takeo Tamura, Tokyo, Japan, assignor to Tanabe Shiko Kikai Seizo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 2, 1977, Ser. No. 802,971

Claims priority, application Japan, Jun. 17, 1976, 51-71817

Int. Cl.[2] B65H *3/04*

U.S. Cl. 271—35 **8 Claims**

1. A device for feeding flat sheets of relatively stiff material which can have warps therein, comprising:

a. a frictional conveyor belt driven in a direction for feeding the sheets;

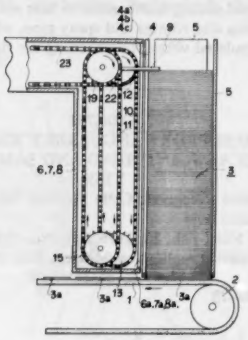
b. a control plate mounted above said frictional conveyor belt and spaced therefrom a distance sufficient to permit passage of only one sheet at a time beneath said control plate and against which a stack of sheets is held, said plate having at least one opening extending vertically therein;

c. a positioning means mounted above the level of said conveyor and spaced from said control plate in the direction opposite the direction of movement of said conveyor for engaging the side of said stack of sheets opposite to the side engaging said control plate;

d. at least one pair of endless movable loops located on the other side of said control plate from said positioning means and at different distances therefrom and each having a vertical run adjacent and parallel to said control plate;

e. a pair of sets of wheels around which said pair of endless loops extend and for moving said endless loops at a constant speed and in a direction for moving the vertical runs downwardly along said control plate;

f. a cardboard holding piece mounted in a horizontal position between said loops and having a tip projecting through said opening in said control plate and said holding piece being movable with said loops while remaining horizontal;



g. a drive shaft for supplying torque to said sets of wheels; and

h. slippable power transmission means between said sets of wheels and said drive shaft.

4,106,765

SHEET FEEDING APPARATUS

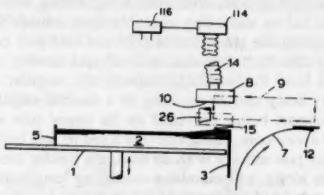
Ronald Howard Britt, Hassocks, England; Jan De Bruin, Bilthoven, Netherlands, and David Gordon Boulter, Wivelsfield Green, England, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 584,154, Jun. 5, 1975. This application Jun. 9, 1976, Ser. No. 694,150

Claims priority, application United Kingdom, Jun. 13, 1974, 26259/74

Int. Cl.[2] B65H *3/40*

U.S. Cl. 271—93 **8 Claims**



1. An apparatus for feeding a sheet of material from the top of a stack of such sheets, comprising:

first suction means for pulling a corner portion of a top sheet of a stack upwards;

means for mounting said first suction means for movement between a lower position in which said suction means is disposed to suck against a portion of the top sheet at a location a given distance from the corner of the sheet, and an upper position;

means for determining when the top of the stack of sheets has fallen below a predetermined level, said determining means comprising a rigid member extending horizontally over said corner portion of the stack between said location and said corner; and actuator means for moving said mem-

ber upwards to a predetermined raised position, and downwards to contact the top sheet;

means operable while said rigid member is in the raised position for moving said first suction means from said lower position to said upper position so as to pull a corner portion of the top sheet from beneath said rigid member and bringing said sheet to a position above said rigid member; and

second suction means for transferring the top sheet away from the stack.

4,106,766

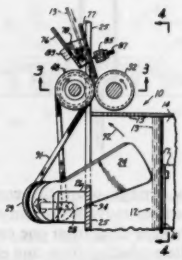
SHEET HANDLING AND STACKING METHODS AND APPARATUS

Rafn Stefansson, San Marino, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed Dec. 8, 1976, Ser. No. 748,624

Int. Cl.[2] B65H *29/44, 31/06*

U.S. Cl. 271—181 **9 Claims**



1. Apparatus for handling sheets, comprising in combination:

means for driving said sheets seriatim from a first region to a second region, including drive roller means for engaging each sheet, and means connected to said drive roller means for rotating said drive roller means to propel each engaged sheet to said second region;

slidable means in said second region for receiving said propelled sheets;

means operatively associated with said slidable means for incrementally actuating said slidable means;

secondary roller means disengaged from said drive roller means;

means for positioning the secondary roller means for engagement and rotation by each sheet engaging said drive roller means; and

means connected to said secondary roller means and said actuating means for transmitting operating power from said rotating secondary roller means to said actuating means.

4,106,767

CONVEYOR SYSTEM FOR FLAT ARTICLES

Harry Schirrmeister, Munich; Gerd von Aschwege, Groebenzell; Harald Helmrich, Munich, and Herbert Bernardi, Arget, all of Germany, assignors to G.A.O. Gesellschaft fur Automation und Organisation mbH, Germany

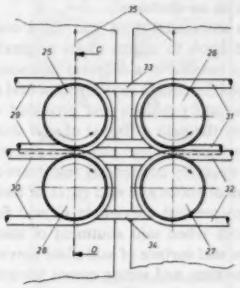
Filed Dec. 13, 1976, Ser. No. 749,665

Claims priority, application Austria, Dec. 12, 1975, 9436/75

Int. Cl.[2] B65H *29/70, 29/12*

U.S. Cl. 271—188 **4 Claims**

1. A conveying system for conveying documents comprising a first conveyor section and a second conveyor section, each of said sections including a pair of endless conveyors, said conveyors respectively being disposed in side by side relationship and having corresponding flight portions contiguously disposed so that a document is conveyed by said contiguous flight portions as said conveyors are driven, said conveyors of said first section having end rollers defining a delivery end, and said conveyors of said second section having end rollers defining an entry end, said delivery end being spaced from said entry end, and said conveyors including a series of belts threaded about the end rollers defining said delivery end and entry end respectively, said belts being threaded about their respective end rollers to project beyond the circumference of its respective end rollers, whereby said belts extending in said contiguous



flight portions of said pair of endless conveyors are staggered to impress upon a document conveyed therebetween an undulating cross-section shape, and including guide belts, said guide belts being threaded about the end rollers defining said delivery end and said entry end of said sections respectively whereby said guide belts extend across the space between said sections.

4,106,768

AMUSEMENT DEVICE

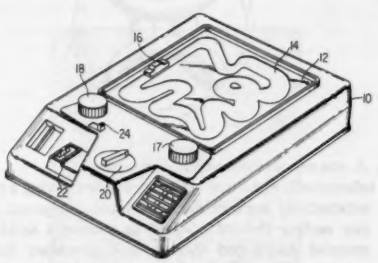
Hideyuki Kanno, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Dec. 10, 1976, Ser. No. 749,416

Claims priority, application Japan, Jun. 23, 1976, 51-83079[U]; Jul. 7, 1976, 51-91044

Int. Cl.[2] A63F *9/14;* **A63H** *30/00*

U.S. Cl. 273—1 M **9 Claims**



1. An amusement device, comprising:

a casing provided with a playing surface having a path;

a body for movement along said path and capable of being attracted by a magnet;

a magnet within said casing below said playing surface for attracting said body;

racks of teeth on said casing;

a housing within which said magnet is mounted and provided with passageway means;

first and second rods intersecting in the vicinity of said housing and passing through said passageway means such that said housing may move along each of said rods, and gears provided at the ends of said rods engaging said racks of teeth;

first and second control knobs corresponding to said first and second rods and provided with gears;

first and second flexible straps provided with racks of teeth and mounted to move within channels provided within said casing, said straps being attached to said first and second rods, and means operatively connecting said gears of said first and second control knobs and said racks of teeth of said flexible straps;

a third control knob mounted to said casing for rotation and provided with an abutment;

spring means associated with said third control knob for urging said knob to return to its original position after having been rotated to a different position; and

a plate mounted for sliding movement in said casing between first and second positions and provided with a surface positioned in the path of travel of said abutment, striking members provided on said plate and positioned to engage said means operably connecting said gears of said first and second control knobs and said racks of teeth of said flexible straps to prevent movement of said first and second control knobs when said abutment of said third control knob strikes said surface of said plate moving said plate to said first position, and spring means normally urging said plate to said second position.

4,106,769

NON-REBOUNDING ARTICLE

Wayne E. Manska, Garden Grove, Calif., assignor to Ronald R. Moody and Wayne E. Manska, Yorba Linda, Calif.

Filed Nov. 3, 1976, Ser. No. 738,445
Int. Cl.[2] A63B *39/00, 43/00*
U.S. Cl. 273—58 B 4 Claims

1. A non-rebounding article comprising,

a substantially rigid thin-walled container having a region of substantially uniform thickness located adjacent the interior surface thereof adapted to receive a solid flexible material distributed therein, said container having an interior volume adjacent said region of uniform thickness and centrally located in said container, said interior volume being adapted to receive the solid flexible material from said region of substantially uniform thickness upon impact of said container with an exterior hard-surfaced object; and,

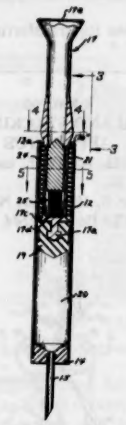
an elastic web composed of solid flexible material substantially located within said region of uniform thickness, said solid flexible material contacting said exterior surface of said container and container being free to move from said region of uniform thickness and initial position adjacent said interior surface into said interior volume upon impact of said container with an exteror hard-surfaced object whereby forces tending to cause the container to rebound from an exterior hard-surfaced object upon impact are absorbed, said solid flexible material having a structural memory to substantially return it to said initial position adjacent said interior surface after impact.

4,106,770

HYPODERMIC SYRINGE PROJECTILE

John M. Gray, 323 Wellesley Rd., Syracuse, N.Y. 13207

Filed Sep. 1, 1976, Ser. No. 719,658
Int. Cl.[2] A63B *65/02;* A61M *5/20*
U.S. Cl. 273—106.5 D 6 Claims



1. A hypodermic syringe projectile comprising a hollow housing, a body member movable within said housing along the longitudinal axis extending from one end of the projectile to the other, a needle extending from one end of said housing, means urging said body member in the direction of said needle, a flexible finger arranged in a side wall of said body member and movable from a non-retaining position to a retaining position, means normally biasing said finger to said non-retaining position, means on said housing engaging said finger at said retaining position to hold said body member rearwardly of said one end against the bias of said means urging said body member in the direction of said needle, a weight disposed for axial movement within a passageway in said body member, and means within said passageway in said body member urging said weight in the direction of said finger, said finger in said non-retaining position normally projecting into said passageway a sufficient distance to block axial movement of said weight, and said weight having a portion which flexes said finger to said retaining position.

4,106,771

GOLFER'S TRAINING DEVICE

Thomas S. Fern, 50777 Lilac Rd., South Bend, Ind. 46628

Filed Jan. 21, 1977, Ser. No. 761,469
Int. Cl.[2] A63B *69/36*
U.S. Cl. 273—183 B 7 Claims

1. A golf training device comprising an elongated base, means for securing said base to the instep portion of a shoe to extend transversely of the shoe, an elongated spring plate projecting from said base longitudinally of said base, and laterally outwardly from the shoe, and an abutment part at the outer end of said spring plate spaced from the base and from

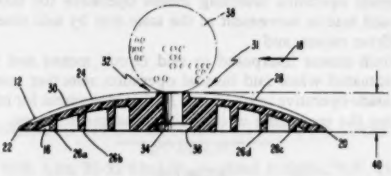
the shoe for engagement with a surface on which a wearer of the shoe stands when the shoe tilts sidewise relative to said surface in the direction in which said spring plate extends, said spring plate including a deformed portion between said base and said abutment, said plate being adapted to produce a sound only incident to a predetermined extent of flexure of said spring plate during change of the lateral angular tilted position of the shoe incident of shifting of the wearer's weight during a golf stroke.

4,106,772

GOLF SWING PRACTICE BASE

Alois Krawagna, Toronto, Canada, assignor to Sports Technology Inc., Toronto, Canada

Filed Jan. 4, 1977, Ser. No. 756,800
Int. Cl.[2] A63B *69/36*
U.S. Cl. 273—186 R **10 Claims**



1. A resiliently deformable base for supporting a golf ball above a support to be struck during the swinging movement of the head of a golf club, the base providing a turf-like feel during the deformation accompanying a practice swing with an iron-type golf club, the base comprising

(a) an upper surface having ribbing oriented substantially parallel to the direction of a preferred golf club head swing path, said top ribbing providing a visual guide to the direction of the preferred golf club head swing path, the upper surface of said top ribbing forming a convex profile along said golf club head swing path;

(b) a bottom surface having ribbing angularly oriented relative to said top ribbing to provide for engagement with the support to inhibit the movement of the base when struck with a club head, said bottom and top ribbing interacting to provide the desired deformation and resiliency, and

(c) means for supporting the golf ball, said means being positioned in said golf club head swing path substantially at the point of maximum elevation on said convex profile, the curvature of said convex profile beginning substantially at the point of maximum elevation and smoothly varying both forwardly and rearwardly of said point along said preferred swing path and terminating substantially in the plane of the support at the respective edges of said base.

4,106,773

CROSSWORD PUZZLE GAME

Nina Coefield, 2225 Beech Dr., Great Falls, Mont. 59404

Continuation of Ser. No. 777,877, Mar. 15, 1977, abandoned. This application Dec. 15, 1977, Ser. No. 860,512
Int. Cl.[2] A63F *9/18*
U.S. Cl. 273—240 **14 Claims**

1. A method of playing a competitive game using apparatus comprising:

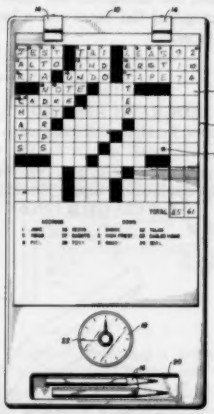
(a) at least one crossword puzzle having associated therewith definitions constituting clues for the solving of said puzzle;

(b) at least two marking apparatuses capable of filling in said crossword puzzle in distinguishable characters such that a character filled in by one of said marking apparatuses is distinguishable from a character filled in by another of said marking apparatuses; and

(c) a timer,

said method characterized as follows:

(i) the contestants take turns filling in said crossword puzzle, each contestant using a different one of said marking apparatuses and the lengths of their turns being measured by said timer;



(ii) values are assigned to portions of said crossword puzzle; and

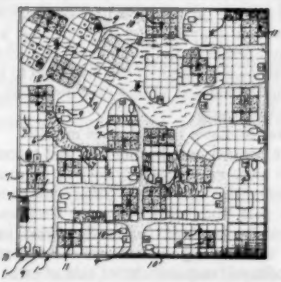
(iii) points are awarded to each contestant based upon the number of said portions filled in correctly during their respective turns.

4,106,774

GOLF GAME BOARD ASSEMBLY

Gérard Newsy Seguin, 3318 Marechal St., Montreal, Canada

Filed Feb. 16, 1977, Ser. No. 769,041
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—245 **5 Claims**



1. A golf game board assembly comprising a game board having a golf course layout marked thereon, polyhedrons having different playing directions marked on the flat faces thereof, golf ball position markers operatively displaced on said game board according to the playing directions pointed out by the polyhedrons upon throwing of the latter in die-like manner, said game board having tee areas, greens, and distances marked thereon and forming parts of said golf course layout, and said polyhedrons include a polyhedron for driving strokes, a polyhedron for fairway strokes, and a polyhedron for putting strokes successively used for the strokes at the tee, along the fairway, and on the green respectively, as the play progresses, the polyhedron for fairway strokes being of smaller size than the polyhedron for driving strokes and of larger size than the polyhedron for putting strokes, and wherein the driv-

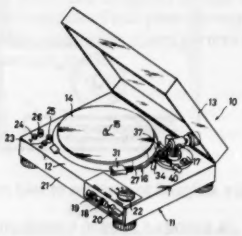
ing polyhedron is a 50-face polyhedron including 18 octogonal flat faces marked each with a numeral and lettering representing a distance and direction, indicating the advance of a golf ball position marker, 8 hexagonal flat faces marked each with a P indicating that a par has been obtained, and 24 trapezoidal flat faces marked each with a dot indicating that a hole-in-one has been obtained, the hexagonal flat faces having a smaller size than the octogonal flat faces and a larger size than the trapezoidal flat faces.

4,106,775

PHONOGRAPH RECORD PLAYER

Kazuyuki Takizawa, Inzai, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 9, 1976, Ser. No. 740,312
Claims priority, application Japan, Nov. 10, 1975, 50/135989
Int. Cl.[2] G11B *17/06*
U.S. Cl. 274—15 R **8 Claims**



1. In a phonograph record player having a rotatable turntable for supporting a phonograph record during the playing thereof, drive means for rotating said turntable, and a tone arm assembly including a tone arm carrying a pickup with a stylus to track the groove of a phonograph record on said turntable during a play operation and being mounted for lateral swinging across said turntable and for raising and lowering of the tone arm relative to said turntable: a control mechanism operative in an automatic lead-in mode for effecting lead-in movement of said tone arm from an elevated rest position outside the perimeter of said turntable to a selected set-down position of said stylus on a record supported by said turntable so as to commence a play operation, and in an automatic return mode for effecting a return movement of said tone arm to said rest position upon the termination of said play operation, said control mechanism comprising

a drive gear rotatable by said drive means;

a rotatable control gear having first and second sets of peripheral teeth engageable by said drive gear for respectively effecting lead-in and return movements of said control gear and being separated from each other by diametrically opposed first and second toothless gaps which, when facing toward said drive gear in stop and play positions, respectively, of said control gear, permit the latter to remain at rest while said drive gear continues to rotate, said control gear further having a continuous cam groove therein;

lead-in and return clutch means mounted on said control gear at diametrically opposed locations, respectively, said lead-in and return clutch means having disengaged positions and engaged positions in which said lead-in and return clutch means are respectively operative for initiating movements of said control gear from said stop and play positions thereof;

a single actuating slide movable between an inoperative position to an operative position for selectively actuating said lead-in and return clutch means to the respective engaged positions when said control gear is in said stop and play positions, respectively;

electromagnetic means associated with said actuating slide and being energizable for moving the latter to said operative position of the slide;

lever means having a cam follower engaging said cam groove for effecting swinging movements of said lever means in first and second directions in response to said lead-in and return movements of said control gear in said automatic lead-in and return modes of operation, respectively;

tone arm drive means for effecting said lead-in and return movements of the tone arm in response to said swinging movements of said lever means in said first and second directions, respectively;

detecting means for providing an electrical output at the completion of a play operation;

circuit means operative for energizing said electromagnetic means and thereby initiating said automatic return mode of operation in response to said electrical output from said detecting means;

manual operation selecting means operative for blocking said lead-in movement of the tone arm by said tone arm drive means; and

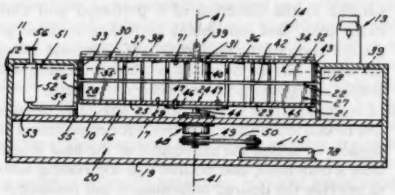
switch means interposed in said circuit means and being actuated when said manual operation selecting means is made operative to block said lead-in movement for inhibiting the energizing of said electro-magnetic means.

4,106,776

FLUIDICALLY SUPPORTED AND FLUIDICALLY DRIVEN TURNTABLE

David M. Gillespie, 451 E. Fourteen Mile Rd., Birmingham, Mich. 48009

Filed Apr. 27, 1977, Ser. No. 791,275
Int. Cl.[2] G11B *3/60*
U.S. Cl. 274—39 R **30 Claims**



1. A turntable assembly for rotatively supporting phonograph records, memory disks and the like comprising:

tank means for receivably containing a quantity of liquid therein;

a first symmetrical member having an axis of rotation and a plurality of generally radially disposed vanes extending generally upwardly therefrom;

a second symmetrical member having an axis of rotation and plurality of generally radially disposed vanes extending generally downward therefrom, said first member and at least a portion of said second member being disposed within said tank means such that the vanes of said first member and at least a portion of the vanes of said second member are immersed in said quantity of liquid contained within said tank means, said second symmetrical member being supportively positioned above said first symmetrical member and spaced apart therefrom by the bouyant force of said liquid without any mechanical connections therebetween so as to establish a fluid coupling therebetween and a fluid bearing between the walls of said tank means and the radially outer portion of said second member such that the axes of rotation are coincident during rotational operation thereof, the plane of said second member being generally parallel to the plane of said first member and both of said planes being generally horizontal such that the vanes of said first member are disposed generally toward the vanes of said second member, and such that

either of said members is free to rotate with respect to the other about said coincident axes;

a turntable platter means carried by the upper surface of said second member for rotation therewith, said platter means being adapted for supportively carrying said phonograph records, memory disks and the like; and

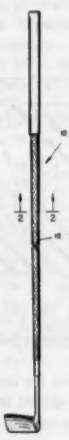
means for rotatively driving said first member such that the rotation thereof causes said quantity of liquid to rotatively circulate within said tank means for drivably rotating said second member via said fluid coupling established therebetween while effectively isolating said turntable platter means from the effects of mechanical vibration and speed fluctuations.

4,106,777

RIGIDIZED SHAFT CONSTRUCTION FOR SPORTS APPARATUS

Sung Baik Kim, 32-32 82nd St., Jackson Heights, N.Y. 11372

Filed Feb. 7, 1977, Ser. No. 765,995
Int. Cl.[2] A63B *53/12*
U.S. Cl. 273—80 B **9 Claims**



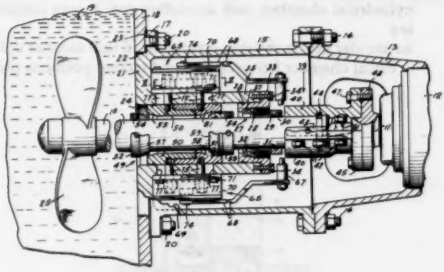
1. A tubular shaft suitable for use in a sports implement, said shaft comprising an elongate peripheral wall, the wall extending about a longitudinal axis, and integral shaft reinforcement means, the reinforcement means including means configuring the peripheral wall in a textured pattern comprising a plurality of equidistantly spaced first areas along a selected neutral planar axis, the plane of which intersect the longitudinal axis, the peripheral wall projecting outwardly beyond the selected neutral axis in the first areas, and a plurality of equidistantly spaced second areas along the selected neutral axis and occupying the spaces between the first areas, and wherein the peripheral wall projects inwardly from the selected neutral axis, the textured pattern further including a plurality of further first and second spaced areas along a second neutral axis adjacent and parallel to the selected neutral axis, wherein the first and second areas of the peripheral wall at the second neutral axis are staggered with respect to the first and second areas of the selected neutral axis.

4,106,778

DEVICE FOR TEMPORARILY SEALING AND SUPPORTING SHAFTS

Alexander D. Cormack, Portland, Oreg., and Boris Kool, Pittsfield, Mass., assignors to Beloit Corporation, Beloit, Wis.

Filed Feb. 23, 1976, Ser. No. 660,514
Int. Cl.[2] F16J *15/06*
U.S. Cl. 277—9.5 **22 Claims**



1. A device for temporarily sealing a normally operatively movable shaft which may extend at one end into fluid under pressure, while primary shaft sealing means adjacent the opposite end of the shaft are being worked on, comprising:

normally inactive secondary sealing means adapted to be located about a portion of the shaft between said one end and the primary sealing means and including collar means for attachment in encircling relation about a selected location on said portion of the shaft and means for securing the collar means fixedly on the shaft adjacent to axially shiftable secondary sealing ring means normally free from the collar means and not movable with the shaft so as to permit the shaft and the collar means to move freely relative to the sealing ring means during operative movements of the shaft;

and actuating means operable for activating said secondary sealing ring means when the shaft is stationary to engage said collar means whereby to effect a fluid retaining seal about the shaft without axial shifting of the shaft, so that the primary sealing means can be released from sealing relation to the shaft and freely worked on substantially without leakage of fluid past the shaft;

said actuating means being operable to release and inactivate said secondary sealing ring means relative to said collar means and the shaft after the primary sealing means have been caused to resume sealing relation to the shaft.

4,106,779

AUTOMATIC SEQUENTIAL DUAL ACTION SEALING SYSTEM

Clarence John Zabcik, Houston, Tex., assignor to Nl Hycalog, Houston, Tex.

Filed Mar. 3, 1975, Ser. No. 554,453
Int. Cl.[2] F16J *15/54, 15/56*
U.S. Cl. 277—27 **5 Claims**

1. A dual action sealing system comprising

a female cylindrical member;

a male cylindrical member having one end thereof inserted into said female cylindrical member, thereby forming an annular fluid passageway in communication with the interior of said male cylindrical member;

said female cylindrical member having an internal annular groove longitudinally surrounding a portion of said male cylindrical member, thereby forming an annular cylindrical chamber defined by said male and female cylindrical members, said annular cylindrical chamber being in fluid communication with the interior of said male cylindrical member by means of said annular fluid passageway;

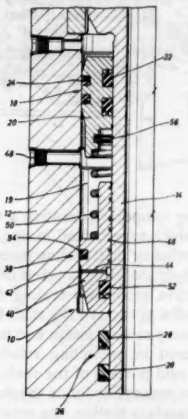
said female cylindrical member also having a fluid outlet

from said annular cylindrical chamber through said female cylindrical member, said fluid outlet being positioned remotely from the annular chamber end nearest the male cylindrical member end inserted into said female cylindrical member;

primary annular seal means positioned between said male and female members for sealing said annular fluid passageway; and

secondary annular seal means positioned in said annular cylindrical chamber, said secondary seal means comprising

an annular piston slidably positioned in said annular cylindrical chamber between first and second positions proximate and remote from the annular chamber end nearest the male cylindrical member and inserted into said female cylindrical member,



inner and outer annular seals positioned between said annular piston and said male and female cylindrical members, respectively,

said annular piston means being provided with an orifice to facilitate low fluid flow rates therethrough into said annular cylindrical chamber and through said fluid outlet without causing said piston to move from said first position to said second position, and

orifice seal means positioned in said annular cylindrical chamber for sealing said orifice when said piston is in said second position.

4,106,780

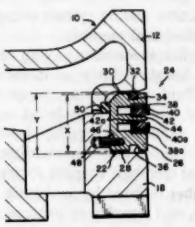
SEAL CARRIER FOR ROTARY PISTON ENGINE

Arthur L. Black, Corning, N.Y., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Oct. 26, 1977, Ser. No. 845,475

Int. Cl.[2] F16J *15/34;* F01C *19/00*

U.S. Cl. 277—81 P **6 Claims**



1. In combination with a rotor which has a seal groove of given width formed by parallel groove surfaces in a surface of said rotor, which rotor is subject to radial and axial, mechanical or dynamic and thermal distortions; a seal carrier received by said groove for carrying a seal for sealing the rotor along said groove; said carrier having a width of less than said given width, to accommodate such groove reception of said carrier in a spaced-apart disposition from thereadjacent said parallel surfaces of said groove; wherein the improvement comprises:

means engaging said carrier, effecting an interpositioning thereof between at least one of said surfaces of said groove and said carrier, for resiliently isolating said carrier from at least radial distortions of the rotor.

4,106,781

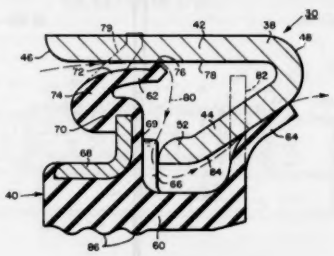
UNITIZED, GREASE-PURGEABLE SEAL

Martin E. Benjamin, Gastonia, N.C., and Dean R. Bainard, Bethel Township, York County, S.C., assignors to Garlock Inc., Rochester, N.Y.

Filed Apr. 28, 1977, Ser. No. 791,866

Int. Cl.[2] F16J *15/32*

U.S. Cl. 277—82 **5 Claims**



1. An annular, unitized, grease-purgeable shaft seal comprising:

(a) an annular wear sleeve for installation on one of a bore and a shaft, said wear sleeve including a cylindrical wall and a flange extending toward the other of a bore and a shaft,

(b) an annular, one-piece, elastomeric member for use on the other of a bore and shaft, said elastomeric member having a cylindrical wall, an inner sealing lip extending toward and into contact with said wear sleeve and located axially inwardly of said flange, and an outer sealing lip extending toward and into contact with said wear sleeve and located axially outwardly of said flange,

(c) each of said sealing lips being outwardly facing sealing lips, whereby said seal provides a grease-purging path past each of said sealing lips, and

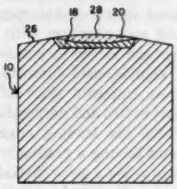
(d) said elastomeric member including a plurality of circumferentially spaced-apart bumper pads in-between said sealing lips, said bumper pads being on an axially outwardly facing surface of a root portion of said inner sealing lip and wherein said flange includes a distal end in contact with said bumper pads for properly locating said wear sleeve with respect to said sealing lips, and for providing a grease purging path past said distal end of said flange.

4,106,782

CERAMIC COATED PISTON RINGS

Glenn F. Hyde, Timonium, and Thomas W. Alban, Glen Burnie, both of Md., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Filed Aug. 18, 1977, Ser. No. 825,753
Int. Cl.[2] F16J 9/12
U.S. Cl. 277—235 A 6 Claims



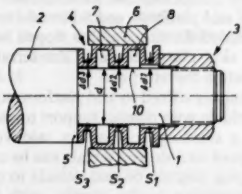
1. A piston ring having a scuff and wear resistant ceramic coating comprised of 35 to 45 percent by weight titanium dioxide and 55 to 65 percent by weight aluminum oxide, said ceramic coating being plasma sprayed on said ring.

4,106,783

CLAMPING DEVICE FOR ACCURATELY CENTERING A WORK-PIECE OR A TOOL

Helmut Glimpel, Lauf a.d. Pegnitz, Fed. Rep. of Germany, assignor to Emuge-Werk Richard Glimpel Fabrik fur Prazisionswerkzeuge vormals Moschkau & Glimpel, Lauf a.d. Pegnitz, Fed. Rep. of Germany

Filed Mar. 30, 1977, Ser. No. 782,688
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1976, 2613526
Int. Cl.[2] B23B 31/40
U.S. Cl. 279—2 R 6 Claims



1. A clamping device for accurately centering a workpiece or a tool, comprising:

a base body;

a clamping sleeve disposed co-axially with said base body;

a clamping device for exerting an axial clamping force on one end of said clamping sleeve;

said clamping sleeve comprising inner and outer radial recesses disposed mutually off-set, and further comprising inner and outer clamping base points disposed mutually off-set;

said clamping sleeve being substantially deformable in the manner of a plate spring;

said clamping sleeve being provided with at least two axially-spaced clamping base points, said base points being separated by one of said recesses disposed in a one-piece sleeve part;

said clamping base points being adapted to face an abutment face of said base body;

a fit clearance being provided between said clamping base points of said clamping sleeve and said abutment face of said base body when said clamping sleeve is in a substantially nontensioned condition;

said fit clearance between said clamping sleeve and said base body increasing in a step-like manner in the direction of said clamping device, from clamping base point to clamping base point, by means of diameter gradation; and

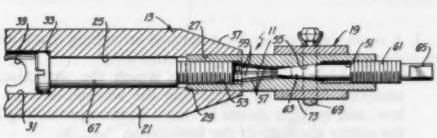
said clamping sleeve being adapted to be pressed against said abutment face of said base body with substantially the same clamping force in the region of each of said clamping base points when said clamping sleeve is in a substantially tensioned condition.

4,106,784

FINISHER'S MANDREL

Michael W. Davis, 2775 Mesa Verde E., Costa Mesa, Calif. 92726

Filed Aug. 12, 1976, Ser. No. 713,684
Int. Cl.[2] B23B 31/40
U.S. Cl. 279—2 R 13 Claims



1. A mandrel for holding a generally tubular workpiece comprising:

an elongated body section having a generally axial passage therein, said passage including a bore and a counterbore defining a shoulder therebetween;

a tubular collet having first and second end portions, said collet being resiliently deformable radially outwardly, said first end portion of said collet being received in said passage of said body section;

a screw in said body and received within said first end portion of said collet to retain said collet against said shoulder;

an expander member received within the tubular collet with at least a portion of the expander being exposed adjacent said second end portion of said collet and with the expander being rotatable relative to the collet, said expander member and said second end portion of said collet having cooperating screw threads thereon whereby the expander member is threadedly attached to said collet;

cooperating wedge surface means on said collet and said expander responsive to the rotation of the expander relative to the collet to radially expand the collet with such radial expansion being usable to firmly mount the workpiece;

said body section including first and second axially arranged portions, said first portion of said body section having opposed substantially flat external surfaces to facilitate gripping the body section in a vise and the second portion of the body section having a generally cylindrical outer surface;

means for radially expanding said second portion of said body section; and

an expandable mounting sleeve positioned on and at least substantially circumscribing said collet.

4,106,785

WORKPIECE HOLDER FOR A VERTICAL BROACHING MACHINE FOR BROACHING ANNULAR WORKPIECES

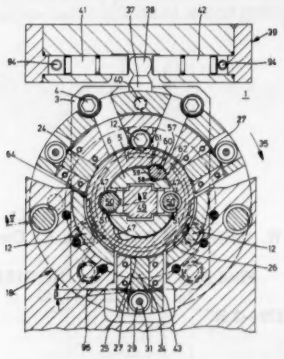
Wolfgang Marten; Herbert Holstein, and Gustav Esser, all of Solingen, Fed. Rep. of Germany, assignors to Oswald Forst Maschinenfabrik und Apparatebauanstalt GmbH, Solingen, Fed. Rep. of Germany

Filed Jan. 7, 1977, Ser. No. 757,665

Claims priority, application Fed. Rep. of Germany, Jan. 7, 1976, 2600272

Int. Cl.[2] B23B *31/16*

U.S. Cl. 279—4 10 Claims



1. A workpiece holder for a vertical broaching machine for broaching an annular workpiece, comprising:

non-rotatable support means, on which the workpiece is received, for axially supporting the workpiece from below, said support means having a portion projecting into the center aperture of the workpiece;

tangential immobilization means, insertable between the portion of said support means projecting into the center aperture and the inner surface of the workpiece, for tangential immobilization of the workpiece; and

radial immobilization means for radial immobilization of the workpiece when in place on said support means, said radial immobilization means comprising:

at least two centering pieces disposed about the outer surface of the workpiece when in place on said support means, and

a common drive means for simultaneously driving all of said centering pieces into radially pressing engagement with the exterior of the workpiece.

4,106,786

RECREATIONAL VEHICLE FOR USE ON SLOPING TERRAINS

Earl Raymond Talbott, 409 Jeff St., Newell, W. Va. 26050

Filed May 5, 1977, Ser. No. 793,835

Int. Cl.[2] B62B *13/18*

U.S. Cl. 280—8 9 Claims

1. A recreational vehicle adapted to be ridden by a person down sloping terrain, said vehicle comprising:

(a) a riding platform having a periphery, and an aperture provided in said platform and elongated in the direction of movement intended for said vehicle;

(b) wheel means having an axle portion, said wheel means mounted in the aperture in said platform with said axle portion affixed to said platform and disposed perpendicular to the direction of movement intended for said vehicle, the diameter of said wheel means being sufficient that an appreciable portion thereof projects beneath said platform and an appreciable portion thereof projects above said platform;

(c) elongated, spaced forward skid means affixed to and projecting beneath said platform with the length dimensions thereof disposed in the direction of movement intended for said vehicle, said forward skid means positioned laterally on opposite sides of a vertical plane through said wheel means and perpendicular to said wheel means axle portion, the leading edge portions of said forward skid means having a gradually upwardly sloping configuration to provide a smooth skidding surface with the terrain to be traversed and extending a sufficient distance forwardly to prevent the leading edge portions of said platform from contacting the terrain to be traversed, and the distance said wheel means projects beneath said platform being greater than the distance said forward skid means project beneath said platform;

(d) elongated, spaced rearward skid means affixed to and projecting beneath said platform with the length dimensions thereof disposed in the direction of movement intended for said vehicle, said rearward skid means positioned laterally on opposite sides of a vertical plane through said wheel means and perpendicular to said wheel means axle portion, the trailing edges of said rearward skid means extending a sufficient distance rearwardly to prevent the trailing edge portions of said platform from contacting the terrain to be traversed, the distance said wheel means projects beneath said platform being greater than the distance said rearward skid means project beneath said platform, when said vehicle is appreciably tilted with respect to the terrain upon which it is supported, at least one of said forward skid means and said rearward skid means contacting the terrain before any peripheral portion of said platform, and when said vehicle is moving in its intended direction and is tipped backwardly, said rearward skid means contacts the terrain to provide a braking action therefor; and

(e) support means affixed to said platform to provide a rider on said vehicle with manual support to enable the rider to maintain a standing position on said vehicle, whereby vehicle speed on a sloping terrain can be controlled by the rider varying position on said vehicle to control the vehicle angle relative to the terrain, with braking accomplished by the rider shifting weight backward to cause said rearward skid means to contact the terrain in a skidding fashion and effect vehicle braking.

4,106,787

DEVICE FOR LOCKING A REMOVABLE SKI CROSSING DEFLECTOR

Dieter Thon, Munich, Fed. Rep. of Germany, assignor to Safety Jet, Munich, Fed. Rep. of Germany

Filed Dec. 8, 1976, Ser. No. 748,614

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1975, 7539332[U]

Int. Cl.[2] A63C *11/00*

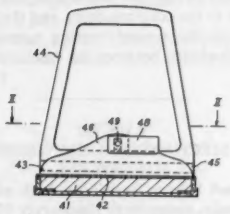
U.S. Cl. 280—11.37 E 12 Claims

1. A device, for locking a ski-crossing deflector on a ski, which comprises:

(i) a base plate including a base to be secured to a ski, and a pair of side portions upstanding on said base and spaced transversely of the base, each of said side portions including a respective substantially rectangular opening and said openings being aligned transversely of the base, one of said side portions including a recess opening at its outer

face, the base plate being resiliently deformable to permit movement of the side portions towards and away from each other,

(ii) a cotter pin for insertion through the side portions to serve for clamping a ski-crossing deflector onto the base, said cotter pin having at one end a T-shaped configuration in which the cross-piece of the "T" is shaped similarly to but is of smaller dimensions than the substantially rectangular openings of the side portions, such that the T-shaped configuration can pass through the openings when the cross-piece is aligned longitudinally with the openings but



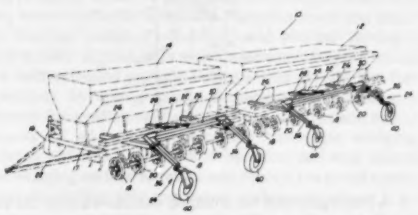
is prevented from passing through the openings when cotter pin is rotated so that the cross-piece is not aligned with the openings, said cotter pin having at its other end a handle portion having on a face thereof abutting said one side portion a projection which is positioned to engage into said recess, when the cotter pin is in a position of rotation in which the cross-piece is not aligned with the opening of the other side portion, thereby to retain the cotter pin in said position of rotation, said projection being releasable from said recess by forcible rotation of the cotter pin and resilient movement of the side portions towards each other.

4,106,788

HOE DRILL CARRIER

Darrell F. Bohnert, Jewell, Kans. 66949

Filed Jun. 6, 1977, Ser. No. 803,528
Int. Cl.[2] A01B *63/22*
U.S. Cl. 280—43.23 **4 Claims**



1. A hoe drill carrier for mounting on the rear of a hoe drill, the carrier co-acting with the front wheels of the hoe drill in transporting the hoe drill, the carrier comprising:

a pair of horizontal stationary mounting brackets for mounting on the rear of the hoe drill and disposed parallel to each other, said brackets adapted to be disposed perpendicular to the width of the hoe drill, said mounting brackets having forward and rearward ends, the rearward ends of said mounting brackets adapted to extend outwardly from the rear of the drill;

an elongated rock shaft pivotally mounted on the rearward ends of said mounting brackets, said shaft adapted to be disposed parallel to the width of the hoe drill, said shaft further being disposed intermediate the forward and rearward ends of said brackets;

a pair of parallel lift arms having forward and rearward ends, said lift arms mounted on the ends of said rock shaft and perpendicular thereto, said lift arms extending rearwardly and downwardly from the rearward ends of said mounting brackets and extending below the level of said brackets;

a pair of caster wheels mounted on the rearward ends of said lift arms; a horizontal stationary hydraulic cylinder mounting bracket disposed parallel to said mounting brackets and therebetween, said hydraulic cylinder mounting bracket mounted on the rear of the hoe drill; and

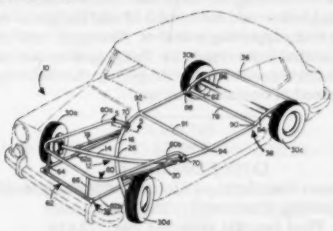
a hydraulic cylinder pivotally mounted on top of said hydraulic cylinder mounting bracket, the hydraulic ram of said hydraulic cylinder attached to said rock shaft for raising and lowering said rock shaft, such that when said shaft is raised, said caster wheels attached to the rearward ends of said lift arms are lowered downwardly contacting the ground surface and raising the rear of the hoe drill above the ground surface.

4,106,789

MOTOR VEHICLE SUSPENSION SYSTEM

Steve High, 3526 Wyoming NE. Apt. 101, Albuquerque, N. Mex. 87111

Filed May 9, 1977, Ser. No. 794,976
Int. Cl. B60g *11/04*
U.S. Cl. 280—793 **11 Claims**



1. A suspension system for a motor vehicle comprising

first and second crossover supporting members, said first crossover member extending from substantially a rearward section on a first side of the vehicle to a side front section of the vehicle, and said second crossover member extending from said rearward section on the second side of the vehicle to an opposing side front section of the vehicle, said first and second crossover members crossing each other at least once,

first and second means for connecting a front wheel to a front end portion of each of said first and second members respectively,

means for integrally connecting rear wheels to rearward portions of said first and second crossover members,

said first and second members being free to move relative to one another in a substantially vertical direction at each crossover point of said members,

said first member, at least at a rearward portion, being placed under torsion in response to vertical movement of the front end portion of the member,

said second member, at least at a rearward portion, being placed under torsion in response to vertical movement of the front end portion of the member,

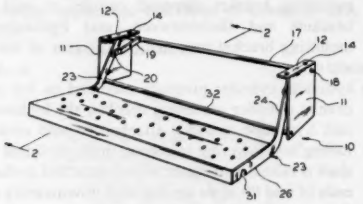
means for restraining longitudinal movement of the front end portions of said crossover members while allowing said respective front end portions to move substantially freely and independently, in the vertical direction, and

frame means integrally connecting said rearward portions.

4,106,790
VEHICLE STEP

Raywood C. Weiler, Fontana, Calif., assignor to Blackstone Manufacturing Co., Inc., Chicago, Ill.

Filed Apr. 6, 1977, Ser. No. 785,058
Int. Cl.² B60R *3/02*
U.S. Cl. 280—166 **5 Claims**

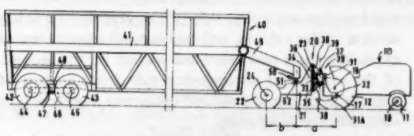


1. A retractable step for vehicles and the like comprising a pair of spaced vertical brackets, each having a flange along the top edge, with the flanges being directed towards each other, a transverse shaft journalled in said brackets for rocking movement, a pair of spaced levers fixed to said shaft each in close proximity to a respective bracket, a pair of tread supporting members each having forward and rearward arms angularly related, with each rearward arm being pivotally connected to a respective lever at a point spaced from the upper end of the rearward arm, a tread rigidly secured to the forward arms, a transverse bar extending between said brackets and disposed forwardly and below said shaft, each of said flanges overhanging a respective supporting member, the upper end of each rearward arm abutting a respective flange and an intermediate portion of each supporting arm engaging the bar when the tread is disposed in operative position.

4,106,791
COUPLING DOLLY

Robert Johnson Greatbatch, 2 Holmlea, Quadring Road, Gosberton, Spalding, Lincolnshire, England

Filed Sep. 13, 1976, Ser. No. 722,613
Claims priority, application United Kingdom, Sep. 13, 1975, 37709/75
Int. Cl.² B62D *53/06*
U.S. Cl. 280—423 A **6 Claims**



6. A vehicle assembly comprising an agricultural-type tractor, a coupling dolly connected to said tractor and a load-carrying semi-trailer connected to said coupling dolly, in which:

said tractor has front and rear wheels and pitching bearing means defining a horizontal forwardly disposed pitching axis disposed between the axes of the front and rear wheels of the tractor and extending transversely of the tractor below the level of the axis of said rear wheels;

said coupling dolly has a chassis having front and rear ends, support surface engaging rolling means supporting the rear end of the chassis, a weight transfer hitch connected to the front end of the chassis and first universal coupling means mounted on the chassis between the front and rear ends of the chassis; and

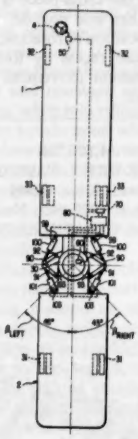
said semi-trailer has a load bearing frame having front and rear ends, support surface engaging rolling means supporting the rear end of the frame, a draw bar projecting forwardly of the front end of the frame, and second universal coupling means which are mounted on the front end of the draw bar and cooperate with the first universal coupling means to form a ball-and-socket joint which connects the semi-trailer to the coupling dolly for pivotal articulation about mutually intersecting rearwardly disposed pitching rolling and yawing axes;

the weight transfer hitch having first bearing means which cooperate with the pitching bearing means of the tractor to connect the coupling dolly to the tractor for pitching articulation about said forwardly disposed pitching axis, second bearing means for permitting rolling articulation between the tractor and the coupling dolly about an axis which is disposed above the rearwardly disposed rolling axis provided by the ball-and-socket joint connecting the semi-trailer to the coupling dolly, and third bearing means connected to the second bearing means for permitting yawing articulation between the tractor and the coupling dolly.

4,106,792
LOCKING MECHANISM ARRANGEMENT FOR A HINGED BUS

Otto Schultz, and Hilmar Feutlinske, both of Hamburg, Fed. Rep. of Germany, assignors to Hamburger Hochbahn Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 572,097, Apr. 28, 1975, abandoned. This application Nov. 23, 1976, Ser. No. 744,402
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1974, 2420203
Int. Cl.² B62D *53/06*
U.S. Cl. 280—432 **9 Claims**



1. A locking system for a hinged vehicle wherein the vehicle has a front section and a rear section which are connected by a hinge between which determines the deflection angle, wherein the front section has a pair of passive axles for supporting a set of fixed rear wheels and a set of steerable front wheels between which determines the angle of lock upon steering the front wheels, and wherein the rear section has a single powered axle which powers a set of wheels for driving the vehicle, the locking system preventing the front and rear section from exceeding a maximum deflection angle predetermined for each angle of lock when cornering, the locking system comprising

at least one sensing means for sensing the angle of lock and the deflection angle of said hinge, wherein said sensing means is connected with comparing means for sensing the maximum predetermined deflection angle of said hinge for each angle of lock, and hinge locking means having a hinge locking mechanism disposed around the hinge and

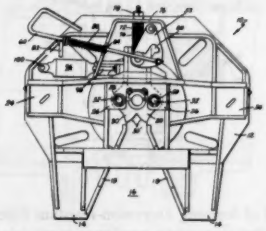
between the front section and the rear section, said hinge locking means being operative by the comparing means in one direction against enlargement of the deflection angle greater than the maximum deflection angle of said hinge which is predetermined upon reaching the maximum steering deflection angle for the angle of lock, the hinge normally being unlocked under normal driving conditions.

4,106,793

FLUID WEDGED DOUBLE LOCK FIFTH WHEEL

Charles G. Neff, Saratoga, Calif., assignor to William F. Beebe, Holland, Mich., a part interest

Filed Mar. 28, 1977, Ser. No. 781,859
Int. Cl.[2] B62D *53/10, 53/12*
U.S. Cl. 280—435 **8 Claims**



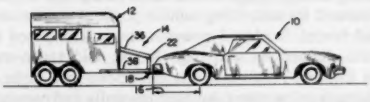
2. A fifth wheel hitch having a bifurcated slide plate with a convergent mouth terminating in a throat for receiving a kingpin, and kingpin locking mechanism at said throat having a pair of pivotally mounted jaws in opposing relation astraddle of said throat, each having a forward portion and a kingpin engagement portion, and each being pivotally shiftable between a kingpin engagement position wherein said forward portions are spaced from each other and a kingpin-receiving or releasing position wherein said forward portions approach each other; a plunger shiftable between a retracted position not between said pivotal jaw forward portions and an extended position between said pivotal jaw forward portions to retain said pivotal jaws from shifting out of kingpin engagement position; retractor means for retracting said plunger; transverse wedging means shiftable between a retracted condition and a plunger binding wedging condition; said plunger having a wedging surface aligned with said transverse wedging means when in said extended position between said pivotal jaw forward portions, for engaging said transverse wedging means; track means for guiding said plunger, and stop surface means transversely of said track means, said transverse wedging means being shiftable to a position between said stop means and said wedging surface to retain said pivotal jaws; and actuator means for shifting said transverse wedging means.

4,106,794

MULTIPLE BAR LINKAGE TOWING SYSTEM

Daniel V. Sallis, 5720 Blue Sage Dr., Littleton, Colo. 80123

Filed Sep. 8, 1975, Ser. No. 611,318
Int. Cl.[2] B62D *53/00*
U.S. Cl. 280—456 R **6 Claims**



1. Towing apparatus for connecting the forward portion of a trailer mounted on road wheels to the aft portion of a towing vehicle having a laterally extending rear axle located well forward of the aft end of the vehicle and having road wheels connected to the ends of the axle, comprising:

forward hitch means carried by the body of the towing vehicle aft of the rear axle including a plurality of longitudinally extending mounting members connected at their forward ends to the body of the vehicle for swinging laterally only about a generally vertical axis, and at least one first attachment member connected to the aft end of each mounting member rearward of the aft end of the vehicle;

aft hitch means carried by the forward portion of the trailer including a plurality of second attachment members located substantially at the forward end of the trailer;

the first attachment members being located substantially in a generally upright and laterally extending plane and being spaced vertically and laterally in a predetermined pattern;

the second attachment members being located substantially in a generally upright and laterally extending plane in a pattern corresponding generally with the pattern arrangement of the first attachment members but with greater vertical and lateral spacing;

and a multiple tow bar linkage extending between the trailer and the towing vehicle including upper and lower elongate bars extending longitudinally between corresponding first and second attachment members, mounted at their forward ends to the first attachment members for swinging vertically only about a lateral axis, and mounted at their aft ends to the second attachment members for swinging vertically and laterally;

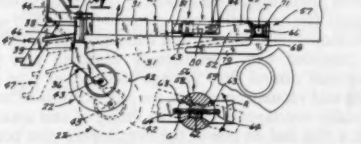
all of the attachment members being so located vertically and laterally that all of the tow bars connected thereto converge forwardly to define a virtual pivot point adjacent to the longitudinal axis for vertical and lateral swinging well forward of the aft end of the vehicle.

4,106,795

GROUND SUPPORTED FRONT MOUNTED TRACTOR ATTACHMENT

James Henning, R.F.D. 1, Hennepin, Ill. 61327

Filed Aug. 5, 1976, Ser. No. 712,099
Int. Cl.[2] B60D *3/00*
U.S. Cl. 280—481 **6 Claims**



1. A front mounted vehicle attachment steerable with and pushed by a vehicle, comprising:

(a) a portable frame positionable forwardly of the vehicle,

(b) a pair of caster wheels,

(c) means for supporting the caster wheels on the frame at transversely spaced positions relative to the vehicle,

(d) a drive linkage between the frame and vehicle,

(e) means for connecting the frame to the drive linkage for pivotal movement of the frame about a generally longitudinal axis relative to the vehicle, including:

(1) a pivotal shaft connected at one end to the frame so as to extend rearwardly therefrom,

(2) a cylindrical sleeve connected to a front portion of the drive linkage for pivotally receiving the pivot shaft in axial alignment therewith, and

(3) means for releasably longitudinally securing the pivot

shaft within the sleeve, comprising an elongated pin insertable through a hole provided therefor in the pivot shaft with opposite ends of the pin slidably engageable within generally vertical slots in opposite sides of the cylindrical sleeve to provide limited pivotal movement of the pivot shaft about an axis extended through the sleeve generally longitudinally of the vehicle, and

(f) means for connecting the drive linkage to the vehicle for pivotal movement of the frame about a generally transverse axis relative to the vehicle.

4,106,796

CONNECTOR FOR DUCT SYSTEMS FOR LOW TEMPERATURE FLUIDS

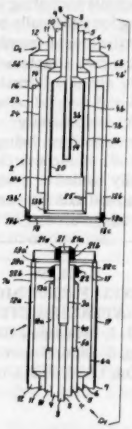
Stefan Asztalos; Alfred Stephan, both of Munich, and Reinhold Mayer, Geretsried, all of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed Jan. 12, 1977, Ser. No. 758,789

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1976, 2601117

Int. Cl.² F16L *47/00*

U.S. Cl. 285—133 R **13 Claims**



1. A connector for a multipipe duct system having two duct parts each comprising a central flow passage, and at least one vacuum chamber coaxially surrounding said flow passage, said connector comprising a male member connected to one of said parts and a female member connected to the other of said parts and telescopingly receiving said male member, said members being provided with telescopingly engaging pipe portions forming said central flow passage and further pipe portions defining said vacuum chambers, the pipe portions of said members axially overlapping upon the fitting of said members together, a ring seal on one of the overlapping pipe portions of one member, and an axially extending sealing surface on a pipe portion of the other member overlapped thereby and slidably engageable by said ring seal for sealing said flow passage against the exterior, each of said members comprising a first pipe portion telescopingly engaging the first pipe portion of the other member to form said central flow passage through the connector, a second pipe portion coaxially surrounding said first pipe portion and telescopingly engaging the second pipe portion of the other member to define an intermediate flow passage through said connector, a third pipe portion coaxially surrounding said second pipe portion and sealed thereto at the end of the respective member to form an inner vacuum chamber, a fourth pipe portion coaxially surrounding said third pipe portion and telescopically engaging the fourth pipe portion of the other member to define an outer flow passage therewith, and a fifth pipe portion coaxially surrounding said fourth pipe portion and sealed thereto at the end of the respective member to define an outer vacuum chamber, the inner vacuum chambers of said members and the outer vacuum chambers of said members overlapping upon the fitting of said members together.

4,106,797

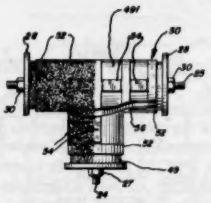
REINFORCED FITTING CONSTRUCTION

Vesta F. Michael, Big Spring, Tex., assignor to Fiber Glass Systems, Inc., Big Spring, Tex.

Filed May 7, 1976, Ser. No. 684,097

Int. Cl.² F16L *41/00*; B65H *81/00*

U.S. Cl. 285—156 **10 Claims**



1. A method of forming corrosion-resistant fitting constructions having tubular conduit portions, comprising forming a first integral, seamless fitting body about a form from resin-saturated glass filaments arranged substantially transversely and parallel to the central axes of the fitting tubular portions; welding a plurality of spaced, annular metal reinforcement straps about each of said tubular conduit portions; welding the conduit reinforcement portions together with reinforcement connection means so as to form an integral, rigid, reinforcing metal case about said first fitting body; the elements of said metal cage being in snug engagement with the surface of said first fitting body; completing the formation of said fitting construction by application of additonal uncured resin and glass filament reinforcements until a fitting construction of desired dimensions is formed with said cage embedded within the thickness of said fitting construction and hidden from view whereby said fitting tubular portions are reinforced by said cage against axial and torsional forces said fitting construction being substantially free of interior voids, curing the additional uncured resin, and removing said form from the resulting fitting construction.

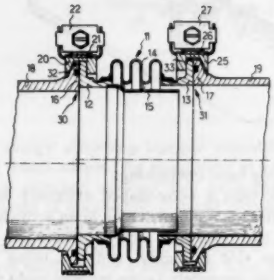
7. A fitting construction comprising a hardened, resinous, corrosion-resistant body of seamless, unitary construction having tubular portions formed along intersecting axes; said tubular portions being reinforced by reinforcing filaments of high tensile strength arranged substantially transversely and parallel to the axes of said tubular portions; said filaments being embedded in a cured resin matrix, a unitary reinforcing cage formed of spaced, reinforcing metal straps arranged within the thickness of said tubular portions; said straps of said cage being in the form of annuluses arranged substantially transversely to the axis of the tubular portion in which disposed, and annulus-connecting strap portions connecting said annuluses whereby interstices are defined by said cage straps; said annuluses and connecting straps being joined by welding and comprising reinforcement for said fitting tubular portions against axial and torsional forces; hardened resinous material disposed in said interstices defined by said cage straps; said transverse and parallel filament reinforcements embedded in a resin matrix comprising layer portions disposed inwardly and outwardly of said cage; said layer portions being connected by said hardened resinous material disposed in said strap interstices; the thickness of said fitting construction being substantially void free.

4,106,798

FLUID-TIGHT PIPE COUPLING ARRANGEMENT

Albert Haug, Montmorency, France, assignor to Societe d'Etudes de Machines Thermiques-S.E.M.T., Saint Denis, France

Filed Dec. 13, 1976, Ser. No. 749,770
Claims priority, application France, Jan. 22, 1976, 76 01697
Int. Cl.[2] F16L *51/02*
U.S. Cl. 285—226 3 Claims



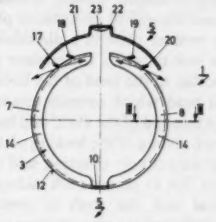
1. A fluid tight coupling system for interconnecting in sealing relationship two longitudinally misaligned pipe sections, each said pipe section terminating in a first integral flange, each said first flange having a first contact face, an expansion compensator bellows having opposite ends interposed between the first flanges of the pipe sections, each opposite end of the bellows corresponding to a respective first contact face of said misaligned pipe sections and having at its respective ends a second flange, each said second flange having a second contact face in surface engagement with corresponding first contact faces, sealing means between the first and second flanges for furnishing a leak-tight seal at the engaged first and second contact faces, means rigidly sealingly joining the second flanges to the bellows, one of said first and second engaging flanges having a substantially frusto-conical shape on a side opposite to its contact face and a first peripheral substantially cylindrical surface extending between the frusto-conical shape and the contact face of said one engaging flange and the other said engaging flange having an annular flat surface on a side opposite its contact face and a second peripheral substantially cylindrical surface extending between the annular flat surface and the contact face of said other engaging flange, the engaged first and second contact faces of the first and second flanges being in a plane substantially perpendicular to the longitudinal axes of the pipe sections and, an annular clip member and means for tightening the clip member around said first and second flanges for clamping each of the first and second engaging flanges together to maintain the engagement of the first and second contact faces, the clip member being formed with a clamp portion having a clamping groove with lateral sides of complementary shape with the respective engaged first and second flanges, the bottom of said groove defining a cylindrical surface having a predetermined extent less than the total extent of the first and second peripheral substantially cylindrical surfaces to maintain the engaged first and second contact faces in bearing relationship.

4,106,799

AT LEAST TWO-PARTITE CLAMPING SLEEVE FOR CONNECTION OF TWO PIPE ENDS PROVIDED WITH FLANGES

Hans Oetiker, Oberdorfstrasse 21, 8810 Horgen, Switzerland

Filed Mar. 18, 1976, Ser. No. 667,942
Claims priority, application Switzerland, Mar. 19, 1975, 3481/75
Int. Cl.[2] F16L *17/00, 19/00, 21/02, 23/00*
U.S. Cl. 285—365 1 Claim



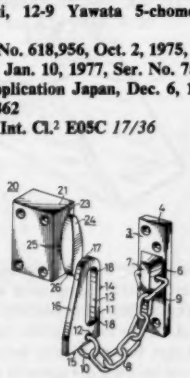
1. An at least two-partite clamping sleeve for connecting two pipe ends provided with flanges comprising: an open ring means including internal lateral side surfaces for abutting at the pipe ends and inclined relative to the ring axis, a substantially cylindrical outer surface means connecting the inclined surfaces, and a center area including a bendable place acting as a stiff hinge which is constructed as an annealed portion of the outer surface means, the lateral surface means being interrupted in the area of the annealed portion, and at least one connecting means formed completely separately of said ring means to be a disposable member and including an ear-like bulge means which is contractable under permanent deformation for the purpose of tightening the clamping sleeve, free ends of the open ring means being provided with one of outwardly directed hook and slot means and the ends of the connecting means being provided with one of slot and hook means for engagement, respectively, with the one of said hook and slot means of the free ring ends, and wherein the connecting means consists of a connecting member made of considerably thinner material than the ring means.

4,106,800

CHAIN LATCH FOR DOOR

Yoshitaka Nakanishi, 12-9 Yawata 5-chome, Ichikawa-shi, Chiba-ken, Japan

Continuation of Ser. No. 618,956, Oct. 2, 1975, abandoned. This application Jan. 10, 1977, Ser. No. 758,186
Claims priority, application Japan, Dec. 6, 1974, 49-140958; Jan. 30, 1975, 50-11862
Int. Cl.[2] E05C *17/36*
U.S. Cl. 292—264 2 Claims



1. A door latch, comprising;
a chain;
a base for fixing a first end of the chain to an inside surface of one of a door unit and a door-frame unit;
a locking plate shaped to approximately resemble a triangle modified by rounding a corner thereof, the locking plate having an elongate slot extending from adjacent the rounded corner along one side of the triangle, and having

a wide locking plate portion disposed adjacent an end of the slot remote from the rounded corner, said portion being fixed to a second end of the chain;

a retainer plate attachable to an inside surface of another of said units; and

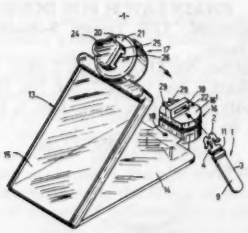
a hook secured to the retainer plate for engagement with and disengagement from the locking member from inside the door and door-frame units when the door is closed and for preventing such disengagement from outside said units, the hook being T-shaped, having a horizontal shaft extending into and secured to the retainer plate, and extending from the retainer plate in a direction parallel to the surface of the unit to which the retainer plate is secured, and perpendicular to the head of the hook, the shaft having a vertical head which extends upwardly and downwardly from a free end of the shaft, said head being dimensioned to permit sliding of the locking plate onto and from the hook, for respectively effecting said engagement and disengagement, but to permit such sliding only when the slot is vertical and the shaft is centered therewith, whereby the wide locking plate portion tends to cause the locking plate, upon its engagement with the hook, to gravitationally slide down on the shaft of the hook with the wide locking plate portion disposed downwardly until the shaft engages an end of the slot adjacent the rounded corner, while permitting that, pursuant to such sliding and engaging, the locking plate is turned on the shaft by the chain, when the door is opened, to prevent said disengagement.

4,106,801

ONE PIECE SECURITY SEAL AND NEW SEALING SYSTEM

Eduardo De Lima Castro Neto, Rua Sao Luiz Gonzaga 912, 20.000, Rio de Janeiro - RJ, Brazil (20.000)

Filed Mar. 25, 1976, Ser. No. 670,318
Claims priority, application Brazil, Apr. 1, 1975, PI-7501943
Int. Cl.[2] B65D *33/34*
U.S. Cl. 292—307 R **11 Claims**



1. Single piece security seal comprising

(a) a first insert portion comprising a rectangular base, a central part extending perpendicularly from the middle of said base and, on the two opposite sides of the free end of said central part, two elastically deformable arms inclined outwardly and backwardly towards said base with a maximum separation between said arms in the undeformed condition which is greater than the corresponding width dimension of said rectangular base;

(b) a second removable portion comprising a blade alined with said central part and provided with a rectangular base having a width and thickness substantially equal to those of said insert portion base; and

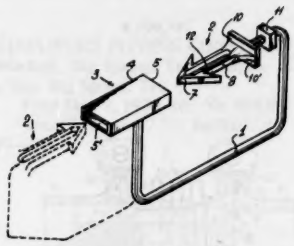
(c) weakened breakable means connecting said bases.

4,106,802

SELF-LOCKING BAND

Battista Lozio, Milan, Italy, assignor to Lozio Battista e Figli S.p.A., Milan, Italy

Filed Mar. 2, 1977, Ser. No. 773,755
Claims priority, application Italy, Jun. 25, 1976, 24716 A/76
Int. Cl.[2] B65D *33/34*
U.S. Cl. 292—320 **9 Claims**



1. A self-locking band comprising:

a flexible link with a hook-shaped extremity having the shape of a flat tongue terminating in an arrowhead; and

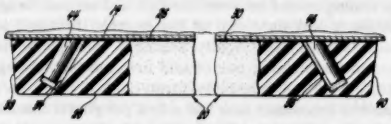
a sleeve with two open ends secured to said link at a point remote from said extremity, said link being internally provided with oppositely facing resilient barbs positioned to coact with said extremity and prevent its withdrawal upon insertion thereof through either of said ends, said sleeve being of rectangular cross-section and provided with said barbs at both minor sides of the rectangle.

4,106,803

MOLDING ATTACHMENT FOR VEHICLE BODY

Alex C. Mair, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 20, 1977, Ser. No. 808,056
Int. Cl.[2] B60R *13/04*
U.S. Cl. 293—62 **2 Claims**



1. In a vehicle body, the combination comprising:

a vehicle body panel having an accessible outer face and an inaccessible inner face;

a molding strip of yieldable resilient material for attachment to the body panel to protect the body panel;

adhesive means acting between the molding strip and the body panel;

a pair of spaced apart circular cylindrical studs of uniform cross section projecting from the surface of the body panel and being inclined away from one another;

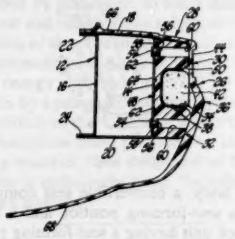
a pair of laterally spaced circular cylindrical bores of uniform cross section provided in the molding strip and having an angle of inclination equal to the angle of inclination of the studs projecting from the body panel, said molding strip being attached to the body panel by longitudinally stretching the molding strip to engage the molding strip over the projecting studs with the studs captured within the bores.

4,106,804

ENERGY ABSORBING BUMPER ASSEMBLY

Jerry V. Scrivo, Durham, N.H., assignor to McCord Corporation, Detroit, Mich.

Filed Feb. 26, 1976, Ser. No. 661,710
Int. Cl.[2] B60R *19/10*
U.S. Cl. 293—63 25 Claims



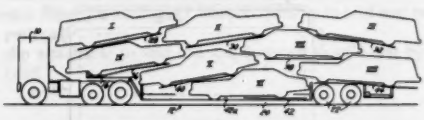
1. An energy absorbing bumper assembly comprising: a mounting means adapted for attachment to a vehicle, an elongated shell disposed adjacent said mounting means, a first bumper means of elastomeric material disposed between said mounting means and said shell for absorbing a first quantity of energy, said first bumper means including at least one pair of blocks, said shell having a front face with upper and lower portions, said pair comprising first and second members spaced vertically apart and defining a cavity interiorly of said front face of said shell, said first member presenting a continuous surface from said cavity through said upper portion of said shell, said second member presenting a continuous surface from said cavity through said lower portion of said shell, and a second bumper means disposed within said cavity for absorbing a second quantity of energy, said second bumper means having a different energy absorbing capacity than said first bumper means said continuous surface of said first member being the only medium between said cavity and said upper portion of said shell, said continuous surface of said second member being the only medium between said cavity and said lower portion of said shell.

4,106,805

VEHICLE TRANSPORT TRAILER

Billy Harold, 6869 Oldham St., Taylor, Mich. 48180

Continuation-in-part of Ser. No. 590,196, Jun. 25, 1975, Pat. No. 3,994,523, which is a continuation of Ser. No. 452,237, Mar. 18, 1974, abandoned. This application Jun. 2, 1976, Ser. No. 692,060
Int. Cl.[2] B62C *1/00*
U.S. Cl. 296—1 A 13 Claims



1. A vehicle transport trailer for carrying a plurality of vehicles comprising:

three upper elevatable tracks operable to be height adjusted in a loaded condition, a first upper track having its front end proximate a forward end of said trailer;

a pair of intermediate tracks adjustable for height, a first of said intermediate tracks substantially aligned below the first of said upper tracks and a second of said intermediate tracks spanning a rear and front respective end of the two rearwardmost upper tracks;

three lower tracks mounted in a bed of said trailer; the rearwardmost two of said lower tracks substantially stationary in said bed and a forwardmost of said lower tracks being vertically movable; and

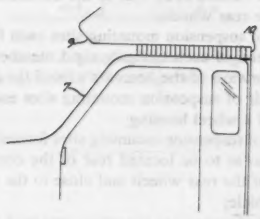
lifting means operably connected to the forwardmost of said lower tracks for lifting and expanding it forwardly between a loading and a loaded position.

4,106,806

WINDSPLITTER TRUCK STABILIZER

Frank M. Haddon, P.O. Box 2135, Downey, Calif. 90242

Filed Feb. 28, 1977, Ser. No. 726,237
Int. Cl.[2] B60P *3/32*
U.S. Cl. 296—23 MC 4 Claims



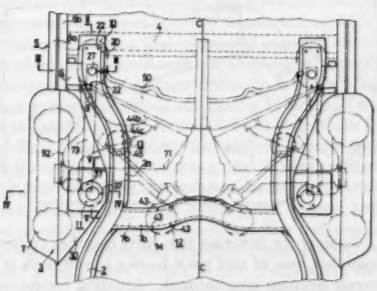
1. A windsplitter truck stabilizer for use with a truck which includes a cab with a pick-up body and a camper carried in said pick-up body which has a forward portion which overhangs the roof of said cab but leaves a space between said camper overhanging portion and said cab roof: wherein said stabilizer is essentially triangular and fills the space between said overhanging camper portion and said cab roof and where said stabilizer is substantially positioned secured to said camper overhang so that an apex of its triangular shape is centered on said camper overhang and pointed forward with the two sides forming said apex sloping outwardly and back about equally toward the outer edges of said camper.

4,106,807

MOTOR VEHICLE BODY CONSTRUCTION

Shinichiro Sakurai, Tokyo, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Apr. 15, 1977, Ser. No. 787,967
Claims priority, application Japan, Apr. 23, 1976, 51-47074
Int. Cl.[2] B60G *9/00*
U.S. Cl. 296—28 R 7 Claims



1. A motor vehicle body construction for supporting the rear suspension of the vehicle comprising:

a floor panel so constructed and arranged to extend from the front of the passenger compartment to the rear end of the vehicle;

a pair of elongate rigid members connected to the floor panel throughout at least a portion of their length, each being

arranged to extend symmetrically with respect to the other from a first position, located near the side of the vehicle and forward of the common axis of rotation of the rear wheels, substantially parallel to the center line C of the vehicle to a second position between the rear end of the vehicle and the common axis or rotation of the rear wheels;

a pair of rear wheel housings each so constructed and arranged to cover the rear wheels of the vehicle, and be located outboard of an elongate rigid member and not extend further than said first and second positions;

a cross member connected symmetrically at its both ends to the pair of elongate rigid members and arranged to extend across the vehicle body rear of the common axis of rotation of the rear wheels;

a first pair of suspension mounting sites each formed at the forward end of each elongate rigid member so as to be located forward of the common axis of the rear wheels;

a second pair of suspension mounting sites each formed at the top of a wheel housing;

a third pair of suspension mounting sites formed on the cross member so as to be located rear of the common axis of rotation of the rear wheels and close to the centre line C of the vehicle;

a fourth pair of suspension mounting sites each formed on an elongate rigid member so as to be located between the first suspension mounting site and the common axis of rotation of the rear wheels; and

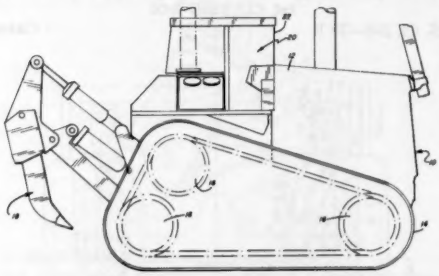
bracket means connectable to the suspension mounting sites so that a plurality of different types of vehicle rear suspension may be interchangeably fitted to the vehicle.

4,106,808

TAPPING STRIP RETAINER

Michael B. Hyde, Pekin, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 16, 1977, Ser. No. 778,201
Int. Cl.² B62D *23/00*
U.S. Cl. 296—35 R **10 Claims**



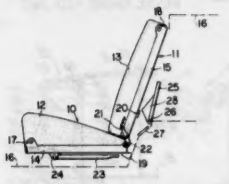
1. In a retainer for fastening two parts together comprising an elongate bar, one of said parts having a wall with at least one elongate opening therethrough, mounting means passing through one of said elongate openings and engaging with said elongate bar, fastening means on said bar, mating fastening means on said other of said parts and aligning with said elongate bar, said mounting means being released to adjust the position of said fastening means on said bar into alignment with the fastening means on said other part whereby said fastening means are fastened together and said mounting means is locked to said one part.

4,106,809

CONVERTIBLE SEAT OF A VEHICLE

Karlis Minka, 204 E. Joppa Rd., Towson, Md. 21204

Filed Jul. 26, 1977, Ser. No. 819,157
Int. Cl.² B60N *1/10*
U.S. Cl. 296—69 **23 Claims**



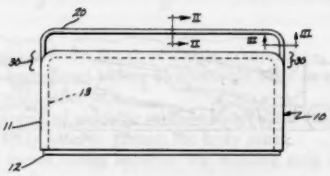
1. In a vehicle body, a convertible seat comprising a seat base unit having a seat-forming position and a load-carrying position, a seat back unit having a seat-forming position and a load-carrying position, first unit support means and second unit support means for supporting the seat base unit and the seat back unit, respectively, on the vehicle body, said units cooperating in the respective load-carrying positions to protectively close a load-carrying space and cooperating in the respective seat-forming positions to comfortably accomodate passengers, the first unit support means supporting the seat base unit for movement of the seat base unit between the seat-forming and the load-carrying positions thereof, the second unit support means supporting the seat back unit for movement of the seat back unit between the seat-forming and the load-carrying positions thereof, the seat base unit constituting in the load-carrying position thereof a forward wall protectively closing the front of the load-carrying space, the seat back unit constituting in the load-carrying position thereof a cover protectively closing the top of the load-carrying space, the upper edge of the seat back unit being at substantially the same level in either one of the seat-forming and the load-carrying positions of the seat back unit, and unit retaining means for positioning and maintaining said units in each of the respective seat-forming and load-carrying positions thereof.

4,106,810

GRAB RAIL FOR TRANSIT VEHICLE SEATS

Chester J. Barecki, Grand Rapids, Mich., assignor to American Seating Company, Grand Rapids, Mich.

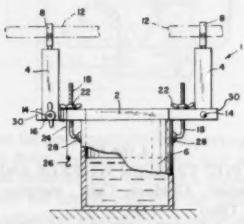
Continuation of Ser. No. 569,970, Apr. 21, 1975, abandoned.
This application Nov. 1, 1976, Ser. No. 737,656
Int. Cl.² A47C *11/00*
U.S. Cl. 297—183 **10 Claims**



1. A seat for mass transportation vehicles having a back portion terminating at an upper edge, a grab rail means having end portions at each end extending upwardly from said upper edge and a central portion connected to said end portions, said grab rail means extending along substantially said entire edge and spaced vertically therefrom a distance so as to provide an open space therebetween thereby providing the functions of a rail for passengers behind said seat to grab to assist them in entering and leaving said seat and providing a barrier means which will minimize the propelling of such passengers over

said seat, the improvement comprising: said grab rail means being constructed of at least one elongated rectangular, tubular core member having a cross section in which the width is greater than the depth, said member being more easily deflected by a force from a vertical direction than from a horizontal direction; said core member being covered on at least the sides and top by a cushioned material covering of a thickness which does not destroy the rail's function of being capable of being grabbed by passengers to assist them in entering and leaving said seat and which when subjected to a force deflects before deflection of the core member; said combination of said deflectable core member and said cushioned material covering providing an energy absorbing grab rail for absorbing forces exerted thereon by a passenger striking the same in the event of sudden deceleration of the vehicle in which the seat is located; said energy absorption being provided by initial deflection of the cushioning material, then deflection of the core member, and if the force is sufficiently great, the subsequent deformation of the core member.

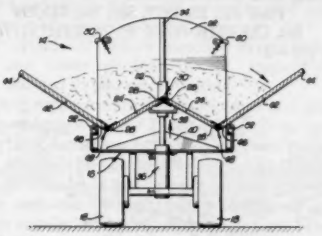
4,106,811
FISHING SEAT, ROD, AND PAIL HOLDER
Henry Hernandez, 1087 Admont Ave., Franklin Sq., N.Y. 11010
Filed Jan. 10, 1977, Ser. No. 757,906
Int. Cl.[2] A01K *97/10*
U.S. Cl. 297—193 **1 Claim**



1. A combined fishing seat and rod and pail holder comprising:
- a horizontal seat,
- a plurality of vertically extending arms removably secured to said seat,
- spring clamps attached to the upper ends of said arms for holding a rod and having their rod engaging surfaces coated with a resilient material,
- a pair of slots extending through said seat,
- a pail positioned under said seat and having a pair of holes in the side thereof,
- an L-shaped member extending through each of said slots in said seat and into each of said holes in said pail,
- means to secure each said L-shaped member to said seat and pail, and
- a clip attachable to said rod and fastened to said seat by a cord.

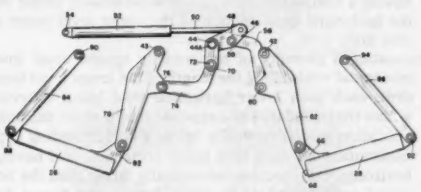
4,106,812
SIDE DUMPING VEHICLE
Lee M. Clark, 4400 Philadelphia #61, Chino, Calif. 91710
Filed May 9, 1977, Ser. No. 794,799
Int. Cl.[2] B60P *1/34*
U.S. Cl. 298—1 B **5 Claims**

5. A side dumping vehicle comprising two bottom walls respectively having inner and outer edges and two side walls respectively having upper and lower edges, first hinge means pivotally interconnecting said inner edges of said bottom walls, two second hinge means respectively pivotally interconnecting said lower edges of said side walls and said outer edges of said bottom walls, two supporting means for respectively moveably supporting said side walls for movement between upright positions and laterally outwardly and downwardly sloping positions, and means for displacing said bottom and



side walls between a trough shaped configuration in cross section and an inverted "V" configuration in cross section.

4,106,813
BOTTOM DUMP DOOR LINKAGE APPARATUS AND DUMP BODY PARTITION MEANS
Edgar R. Goodbary, Cardin, Okla., assignor to Goodbary Engineering Co., Cardin, Okla.
Filed Nov. 23, 1976, Ser. No. 744,432
Int. Cl.[2] B60P *1/56*
U.S. Cl. 298—35 M **4 Claims**



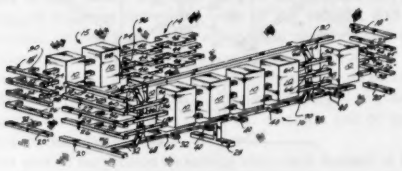
1. In combination with an off-highway vehicle having a dump body provided with a bottom opening for discharge of materials therethrough, a pair of substantially identical longitudinally extending doors mounted in said opening and adapted for alternate opening and closing of the bottom opening, single linkage assembly means operably connected with said doors for opening and closing said doors, said linkage assembly being of a double-acting scissor-type operation maintaining the overall movement of the linkage assembly through a minimum distance during the opening and closing of the doors and single actuator means operably connected at substantially the midpoint of said linkage assembly for actuation thereof during said opening and closing of the doors, said linkage assembly comprising first bell crank means pivotally secured between the actuator means and a fixed pivot point, second bell crank means pivotally secured between said first bell crank means and a first lever means, said first lever means pivotally secured between a fixed pivot point and one of said doors for movement of said door between said open and closed positions therefor, link means pivotally secured to said first fixed pivot point and movable simultaneously with said first bell crank means, third bell crank means pivotally secured between said link means and a second lever means, said second lever means pivotally secured between a third fixed pivot point and the other of said doors for movement of said other door between said open and closed positions simultaneously with the opening and closing of said first-mentioned door.

4,106,814

METHOD OF FORMING IN SITU OIL SHALE RETORTS

Gordon B. French, Bakersfield, Calif., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

Filed Jul. 15, 1977, Ser. No. 815,799
Int. Cl.[2] E21B *43/24, 43/26;* E21C *41/10*
U.S. Cl. 299—2 22 Claims



1. A method for recovering liquid and gaseous products from a plurality of in situ oil retorts in a subterranean formation containing oil shale, such an in situ oil shale retort containing a fragmented permeable mass of formation particles containing oil shale, each retort site having top, bottom and side boundaries, the method comprising the steps of:

excavating an upper level retort access drift through opposite side boundaries of a plurality of such retort sites;

excavating a lower level retort access drift at an elevation below the elevation of the upper level access drift, the lower level retort access drift also being excavated through opposite side boundaries of a plurality of such retort sites;

excavating a plurality of horizontally spaced apart upper horizontal voids along the length of the upper level access drift, each such upper horizontal void being excavated within the boundaries of a separate in situ retort site and having a horizontal cross section substantially larger than the horizontal cross section of the upper level retort access drift;

excavating a plurality of horizontally spaced apart lower horizontal voids along the length of the lower level access drift, each such lower horizontal void being excavated within the boundaries of a separate in situ retort site and at a location spaced vertically below a corresponding upper horizontal void, each such lower horizontal void having a horizontal cross section substantially larger than the horizontal cross section of the lower level retort access drift;

leaving a zone of unfragmented formation between adjacent vertically spaced apart upper and lower voids, such an unfragmented zone having a horizontal free face of formation adjoining each of the adjacent vertically spaced apart voids;

explosively expanding such a zone of unfragmented formation toward the horizontal free faces provided by such upper and lower horizontal voids to form a fragmented permeable mass of formation particles containing oil shale within said top, bottom and side boundaries of such a retort; and

retorting oil shale in the fragmented mass in each such in situ oil shale retort for producing liquid and gaseous products.

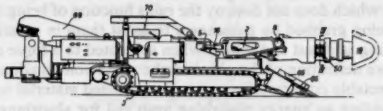
4,106,815

MINING MACHINES

Eric James Dunn, Retford, England, assignor to Dosco Overseas Engineering Limited, England

Filed Nov. 5, 1976, Ser. No. 739,095
Claims priority, application United Kingdom, Nov. 18, 1975, 47440/75
Int. Cl.[2] E21C *25/06*
U.S. Cl. 299—59 4 Claims

1. A mining machine comprising a body, means for driving the body forwardly towards a working face, a boom projecting forwardly from said body, a cutting tool mounted on the forward end of the boom, means for moving said boom relative to said body to effect transversing of a working face by said cutting tool, a drive mechanism for rotating the cutting tool relative to the boom, and said drive mechanism includes a multi-speed gearbox for selectively driving the cutting tool at two or more different cutting speeds, said gearbox including a gear selector lever movable between operating positions corresponding to respective ones of the cutting speeds of said gearbox, means for locking the gear selector lever in each of the operating positions, and a key for operating the locking means, and the drive mechanism for the cutting tool includes a motor and a lock, the motor being inoperable unless the said key is engaged in the lock.

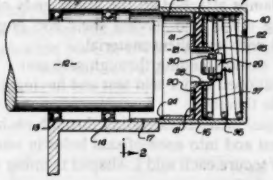


4,106,816

HUB CAP FOR TRAILER WHEELS AND THE LIKE

William S. August, Altadena, Calif., assignor to A-T-O Inc., Willoughby, Ohio

Filed Jun. 28, 1977, Ser. No. 810,808
Int. Cl.[2] B60B *27/00*
U.S. Cl. 301—108 R 6 Claims



1. In a hub cap for a vehicle wheel, the combination of:

a housing having a first open end for mounting on a vehicle and a second opposite end,

said housing including a fixed central member dividing said housing into an inner zone and an outer zone and having at least one opening for providing for grease flow between said zones,

said central member including a boss projecting into said outer zone;

a grease fitting mounted in said boss of said central member;

a seal slidable in said outer zone between a first sealing position in sealing engagement with said housing and said boss and a second non-sealing position out of engagement with said boss; and

a spring retained in said outer zone and urging said seal toward said first position.

4,106,817

APPARATUS FOR PNEUMATICALLY TRANSPORTING POWDERY OR GRANULAR MATERIALS

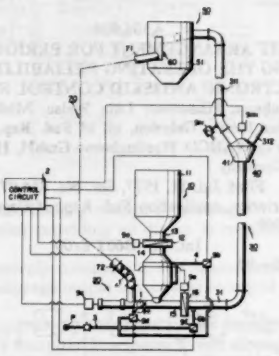
Akihiko Tsuzuku, Hiratsuka; Masao Tanazawa, Tokyo; Masashi Kaminishi, Hiratsuka, and Haruo Imamura, Fujisawa, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Jun. 30, 1976, Ser. No. 701,025

Claims priority, application Japan, Jun. 30, 1975, 50-80694; Jun. 30, 1975, 50-91395[U]; Jun. 30, 1975, 50-91396[U]; Jul. 31, 1975, 50-105149[U]; Jul. 31, 1975, 50-105150[U]; Jul. 31, 1975, 50-105151[U]; Jul. 31, 1975, 50-105152[U]; Aug. 27, 1975, 50-117008[U]

Int. Cl.[2] B65G *51/02, 53/00*

U.S. Cl. 302—17 16 Claims



1. An apparatus for pneumatically transporting powdery or granular material from a material supply unit with a supply pipe to a material receiver unit through a transport pipeline connected between the supply pipe and the material receiver unit, comprising spherical secondary transport mediums each having a diameter slightly less than the inside diameter of said transport pipeline and adapted to be intermittently supplied by supply means into said supply pipe at a position just behind the material to be transported, separation means provided within said material receiver unit for separating the transported material from said transport mediums, and collection means provided between said supply means and said separation means so as to return said transport mediums into said supply means, characterized in that said material supply unit comprises the combination of:

a supply hopper arrangement with a material drop port formed in the lowermost part thereof, said supply hopper arrangement being mounted on the uppermost part of said material supply unit for accommodating therein the material to be transported;

a pressure chamber arrangement with upper and lower opening, said pressure chamber arrangement being provided under the material drop port of said supply hopper arrangement and being fixedly connected at the lower opening thereof to a substantially intermediate portion of said supply pipe for pressurizing the material supplied thereinto from said supply hopper arrangement by the action of airflow under pressure;

a hopper gate arrangement provided between said supply hopper arrangement and said pressure chamber arrangement for opening and shutting the material drop port of said supply hopper arrangement; and

a pipe gate arrangement provided in and mounted on said supply pipe on the side of the distal end of the latter for opening and airtightly shutting said supply pipe,

and in that said supply means for supplying said spherical secondary transport medium comprises:

a first casing fixedly connected to the proximal end of said supply pipe into which said transport medium is dropped one by one;

a second casing fixedly connected between said first casing and said collection means for returning said secondary transport mediums to said supply means;

an outer cylindrical hollow member having opening at upper and lower portions thereof, respectively, and fixedly secured to said second casing;

a cylindrical rotary member having formed in a part of the peripheral surface thereof a recess adapted to contain one by one said secondary transport mediums therein, said rotary member being rotatably, airtightly inserted into said outer cylindrical hollow member and being provided at both ends thereof with shafts journaled by means of bearings installed within both side ends of side outer cylindrical hollow member; and

a rotary driving power source connected to the end of one of shafts for rotating said rotary member.

4,106,818

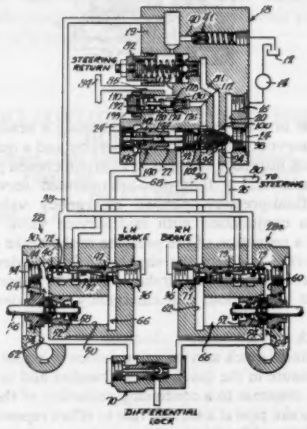
BRAKING SYSTEM FOR VEHICLE

George T. Fiala, Geneseo, Ill., assignor to J. I. Case Company, Racine, Wis.

Filed May 27, 1977, Ser. No. 801,148

Int. Cl.[2] B60T *13/18; 60 547;548;555*

U.S. Cl. 303—11 6 Claims



1. In a braking system for a vehicle including a reservoir; a pressurized fluid source; a fluid actuated brake; brake actuating means having a first conduit connected to said source and a second conduit connected to said reservoir; an auxiliary fluid actuated mechanism connected to said first conduit, and pressure regulating valve means in said first conduit for controlling flow of fluid to said auxiliary fluid actuating mechanism and the pressure of fluid flowing from said source to said brake actuating means with said brake actuating means having a third conduit connected to said pressure regulating valve means, said brake actuating means having movable valve elements defining first and second chambers, said first chamber being in communication with said third conduit and said fluid actuated brake, said movable valve elements having a first position placing said chambers in communication with each other and with said second conduit while blocking flow from said first conduit and a second position placing said first conduit in communication with said second chamber and blocking flow between said second conduit and both chambers, the improvement of said pressure regulating valve means having a valve bore with said first conduit in communication with one end of said bore and said auxiliary fluid actuated mechanism in communication with said bore adjacent said first conduit, a pres-

sure release assembly slidable in said bore and having one end in communication with source and an opposite end in communication with said third conduit, orifice means in said pressure release assembly and in communication with said source, and pilot valve means in communication with said bore and said orifice means so that said pressure release assembly and pilot valve means regulate the pressure of fluid to said brake actuating means and regulate flow of fluid to said auxiliary fluid actuated device at any pressure of said pressurized fluid source.

4,106,819

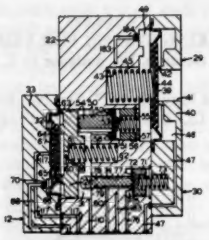
EMERGENCY PORTION FOR A BRAKE CONTROL VALVE

James E. Hart, Trafford, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Aug. 18, 1977, Ser. No. 825,748

Int. Cl.² B60T *15/32, 15/42*

U.S. Cl. 303—38 **36 Claims**



1. For use in a brake apparatus including a brake pipe, an auxiliary reservoir, an emergency reservoir and a quick action chamber each normally charged to a certain chosen pressure, a brake cylinder and a fluid-pressure-operated service valve device, a fluid-pressure-operated emergency valve device operative in conjunction with said service valve device in response to a reduction of the pressure in the brake pipe at an emergency rate to effect the supply of fluid under pressure from said reservoirs to said brake cylinder to cause an emergency brake application, said emergency valve device comprising:

(a) a quick service volume chamber,

(b) a continual quick service valve device operable jointly by the pressure in the quick action chamber and in the brake pipe in response to a continuing reduction of the pressure in the brake pipe at a service rate to effect repeated successive release of fluid under pressure from said quick service volume chamber to atmosphere and thereafter recharge of said quick service volume chamber from the brake pipe to the reduced pressure present in the brake pipe,

(c) restricted means enabling flow of fluid under pressure from the brake pipe to the quick action chamber to provide for charging the quick action chamber from the brake pipe to the pressure in the brake pipe, and

(d) fluid-pressure-operated means operably responsive to the release of fluid under pressure from the brake pipe to atmosphere to so cooperate with said continual quick service valve device and said restricted means as to cause the release of fluid under pressure from the quick action chamber to atmosphere at a rate in excess of said service rate, whereby said continual quick service valve device is rendered sequentially operative to terminate the release of fluid under pressure from said quick service volume chamber to atmosphere and thereafter effect recharging of said quick service volume chamber from the brake pipe to the reduced pressure in the brake pipe, and said fluid-pressure-operated means is rendered sequentially operative in conjunction with said continual quick service valve device to terminate the release of fluid under pressure from the quick action chamber to atmosphere at said rate that is in excess of said service rate to enable the flow of fluid under pressure from the brake pipe to the quick action chamber until the pressure in the quick action chamber is the same as that in the brake pipe.

4,106,820

CIRCUIT ARRANGEMENT FOR PERIODICALLY TESTING THE OPERATING RELIABILITY OF AN ELECTRONIC ANTISKID CONTROL SYSTEM

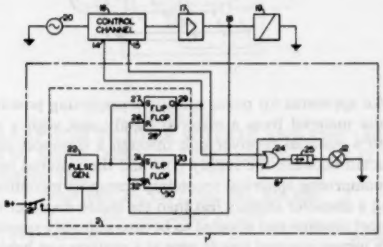
Gerhard Ruhnau, Hannover; Lutz Weise, Misburg a.d., and Karl-Heinz Hesse, Gehrden, all of Fed. Rep. of Germany, assignors to WABCO Westinghouse GmbH, Hannover, Fed. Rep. of Germany

Filed Jul. 11, 1977, Ser. No. 814,077

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1976, 2631569

Int. Cl.² B60T *8/00*

U.S. Cl. 303—92 **19 Claims**



1. A test circuit for periodically monitoring the operational reliability of an electronic antiskid brake control system in which an electro-pneumatic modulator valve device influences the fluid brake pressure of a vehicle, such as a road vehicle, independently of the operator, in response to wheel behavior signals transmitted from a wheel sensor to an electronic control channel having an output amplifier via which a control signal is connected to the modulator valve device, said test circuit comprising:

(a) pulse generator means for emitting a periodic pulse signal;

(b) warning means operatively responsive to the presence of said periodic pulse signal for a predetermined time duration for issuing a warning signal indicative of an impending malfunction of said control channel or said output amplifier;

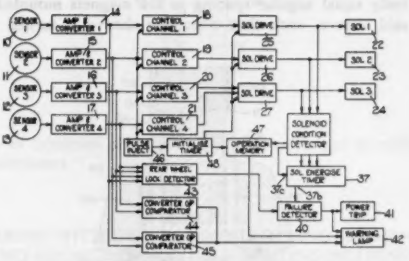
(c) said control channel being normally operatively responsive to said periodic pulse signal for injecting in said control signal an impulse signal having a voltage level corresponding to the opposite digital logic state of said control signal indicative of said control channel and said output amplifier being capable of providing said control signal at a voltage level representative of said opposite digital logic state; and

(d) evaluation means responsive to said injected impulse signal for nullifying said periodic pulse signal at said warning means to prevent operation thereof prior to expiration of said predetermined time duration.

4,106,821
FAILURE DETECTION CIRCUIT FOR A VEHICLE ANTI-SKID BRAKING SYSTEM

Malcolm Brearley, Solihull, England, assignor to Girling Limited, Birmingham, England

Filed Oct. 7, 1976, Ser. No. 730,423
Claims priority, application United Kingdom, Oct. 1, 1975, 40084/75
Int. Cl.² B60T *8/00*
U.S. Cl. 303—92 **9 Claims**



9. An anti-skid braking system, comprising

a wheel sensor providing an output in response to wheel speed,

means operatively connected to said sensor output and providing a slippage output in response to sensed wheel slippage,

coil means operatively connected to said slippage means and selectively energized in response to said slippage output to provide a brake control output,

means operatively connected to said coil means and selectively providing a timing sequence in response to the energisation of said coil means and providing a warning output in response to a timing sequence of a predetermined duration,

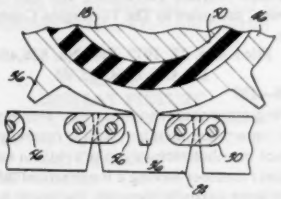
detecting means operatively connected to said coil means and providing a back e.m.f. responsive output in response to the deactivation of said coil means, and

reset means operatively connected to said detecting means and resetting said timing sequence of said timing means in response to said back e.m.f. responsive output.

4,106,822
TRACK GUIDE MECHANISM

Richard A. Lee, Warren, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 14, 1977, Ser. No. 777,253
Int. Cl.² B62D *55/14*
U.S. Cl. 305—28 **1 Claim**

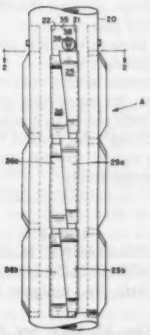


1. In a tracked vehicle comprising a hull, ground-engaging tracks, and hull-mounted roadwheels riding on the track upper faces to absorb road shock forces, each track comprising two rows of ground-contacting blocks, end connectors pivotally joining the blocks along their outer side edges, and center connectors pivotally joining the blocks along their inner facing side edges: the improvement wherein the spaces between adjacent ones of the center connectors are utilized as guide openings to maintain track-roadwheel alignment; selected ones of the roadwheels having guide teeth thereon cooperable with the aforementioned guide openings; each selected roadwheel comprising two axially spaced cylindrical sections ridable on a row of ground-contact blocks, and a series of teeth arranged in the central transverse plane of the wheel for entry into successive ones of the guide openings as the wheel rolls along the block upper surfaces; the side faces of the teeth cooperating with edge surfaces of the blocks to maintain the track in alignment with the roadwheels; each tooth having a circumferential thickness substantially less than the length of each guide opening, whereby the teeth are precluded from striking the center connectors even though the associated roadwheel should slightly advance or retract along the track upper surface; means resiliently connecting the teeth to the associated roadwheel comprising an endless rigid ring (46) having said teeth extending therefrom, said ring being located within an annular groove formed in the peripheral surface of the associated roadwheel, and an endless elastomeric sleeve bonded to the ring inner surface and groove bottom surface, so that circumferential loads on the teeth produce torsional stress in the elastomeric sleeve without destruction of the above-mentioned bonds; said ring having sufficient radial thickness to maintain its initial configuration under load forces on the teeth; each elastomeric sleeve having a substantial radial thickness, whereby the sleeve can undergo torsional strain equivalent to the length of a center connector.

4,106,823
BOREHOLE CONTACTING APPARATUS FOR BOTTOM HOLE ASSEMBLY

Grey Bassinger, 2201 Country Club Dr., Midland, Tex. 79701

Filed Oct. 26, 1977, Ser. No. 845,777
Int. Cl.² F16C *1/26*
U.S. Cl. 308—4 A **14 Claims**



1. A borehole wall contacting apparatus for a drill string comprising:

an elongated body having a drilling fluid passage therethrough and having means for mounting in a drill string;

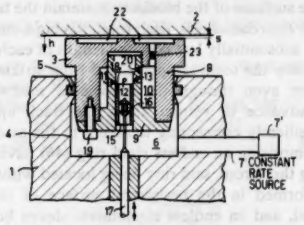
a plurality of radially spaced retaining grooves formed in the outer surface of the elongated body with borehole wall contact means mounted therein;

said borehole wall contact means including at least one pair of coacting elements, each element including a borehole wall contact surface, a retaining groove contacting portion and a camming portion, said camming portions of said pair of elements being slidably engageable upon relative movement of the elements toward each other to force the retaining groove contacting portions into locking engagement with the retaining groove.

4,106,824
HYDROSTATIC SUPPORTING DEVICE

Noel Meystre, Meilen; Alfred Christ, Zurich, and Helmut Miller, Niederrhrodorf, all of Switzerland, assignors to Escher Wyss Limited, Zurich, Switzerland

Filed Nov. 23, 1976, Ser. No. 744,252
Claims priority, application Switzerland, Dec. 2, 1975, 15607/75
Int. Cl.[2] F16C *32/06*
U.S. Cl. 308—9 13 Claims



1. Hydrostatic supporting apparatus for supporting without physical contact a mobile part which is subject to variable loading and moves relatively to a load-bearing part, the apparatus comprising

a. an hydraulic supporting motor including a pressure chamber formed in the load-bearing part and a supporting piston which is urged toward the mobile part by the pressure in that chamber,

b. the supporting piston having one end which is subject to pressure in said chamber and an opposite end which obtains at least one hydrostatic bearing pocket which opens in the direction of the mobile part and serves to provide a pressure cushion which supports that part;

c. a source of hydraulic fluid under pressure which delivers fluid at a constant rate and is connected with the pressure chamber by supply passage means;

d. a first flow passage which is throttled and which interconnects said pocket and chamber;

e. a second flow passage which is connected in parallel with the first flow passage; and

f. throttle valve means having cooperating members carried, respectively, by the supporting piston and the load-bearing part and which serves to increase and decrease restriction to flow through the second flow passage as the supporting piston moves toward and away from the load-bearing part, respectively.

4,106,825
HIGH PRESSURE MAGNETIC DRIVE INCLUDING MAGNETIC THRUST BEARINGS

Robert F. Ruyak, Erie, Pa., assignor to Autoclave Engineers, Inc., Erie, Pa.

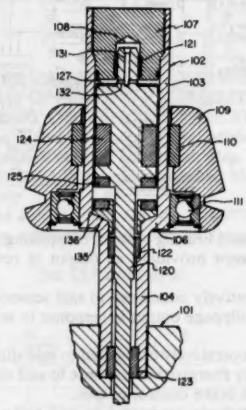
Filed Dec. 13, 1976, Ser. No. 749,789
Int. Cl.[2] F16C *17/10*
U.S. Cl. 308—139 9 Claims

1. A magnetic drive assembly for transmitting torques to the interior of a pressurizable vessel or the like comprising:

a nonmagnetic tubular housing having two portions, one of larger diameter than the other, there being an annular step between the portions of the housing having different diameters, said housing having at the end of the portion of smaller diameter an opening securable to an opening in a pressurizable vessel whereby the housing may be subjected to the vessel pressure, said housing having an opening in the end of the portion of larger diameter and a plug for sealing said last mentioned end;

a sheave coaxial with and surrounding said larger diameter portion of the tubular housing, said sheave mounted rotatably thereto, said sheave carrying circumferentially magnetized rare earth cobalt magnets defining an even number of north and south magnetic poles having substantially equal angular spacing;

a driven shaft journaled in said housing by bushings that impose no axial restraint on said shaft and permit axial passage of the pressurized atmosphere to equalize pressure within said housing, said shaft being long enough to extend through an opening of said housing, said shaft having mounted thereto circumferentially magnetized cylindrical rare earth cobalt magnets defining an equal number of north and south magnetic poles having the same substantially equal angular spacing as the magnets mounted in said sheave, such that when the sheave is turned the



driven shaft will follow, said shaft having at least one annular rare earth cobalt magnet being coaxial with and attached to said driven shaft, in the vicinity of the annular step, said annular magnet being axially polarized;

said nonmagnetic tubular housing having associated therewith at least one annular rare earth cobalt magnet coaxial with the driven shaft secured to the tubular housing near the annular step and said annular magnet being axially polarized and arranged to cooperate with the axially polarized annular magnet attached to said driven shaft so that magnetically opposite poles face to thus repulse the axial movement of the driven shaft toward the pressure vessel maintaining the axial position of said shaft.

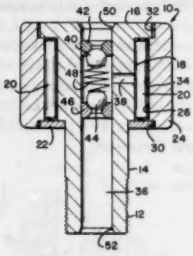
4,106,826
BEARING WITH LUBRICATING SYSTEM

Americo Edward Marola, Torrington, and Leo Stella, Bristol, both of Conn., assignors to The Torrington Company, Torrington, Conn.

Filed Aug. 22, 1977, Ser. No. 826,453
Int. Cl.[2] F16C *33/66*
U.S. Cl. 308—187 6 Claims

1. A bearing comprising: an inner race member with a raceway and an outer race member with a raceway spaced from said inner race member raceway to provide an annular bearing space, the inner member having a longitudinal lubrication bore extending at least partially through the inner member; roller bearing members in said annular bearing space; a communicating passage from the longitudinal bore to the inner member raceway; and at least one one-way check valve mounted within said longitudinal lubrication bore as a permanent part of the inner race member, said valve including a valve seat in direct contact with the wall of the longitudinal lubrication bore and adapted to permit the flow of lubricant through the

longitudinal lubrication bore, through the communicating passage, and into said annular bearing space, and to prevent the



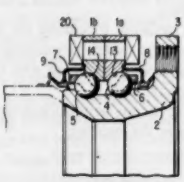
flow of lubricant back past the check valve and to exclude contaminants.

4,106,827

BEARING WITH TWO ROWS OF ROLLING ELEMENTS INCLUDING METHOD OF MOUNTING BEARING

Alain Ducret, Annecy Levieux, and André Maurice Chalesle, Paris, both of France, assignors to Regie Nationale des Usines Renault, Billancourt, France

Filed Apr. 7, 1977, Ser. No. 785,694
Claims priority, application France, Apr. 7, 1976, 76 10061
Int. Cl.[2] F16C *33/76*
U.S. Cl. 308—187.1 11 Claims



1. A bearing comprising:
an outer race;
an inner race having a shoulder radially extending from one side thereof to form a mounting flange;
two bearing grooves in each of said outer and inner races;
two holding and guiding cages of the same continuous circular configuration disposed in parallel relation between said outer and inner races;
two sets of rolling elements arranged in parallel rows in corresponding bearing grooves of said outer and inner races and within respective ones of said two holding and guiding cages and wherein said outer race is made up of a pair of elementary races, each having one of said two bearing grooves therein, such that adjacent faces of said pair of elementary races are brought together.

4,106,828

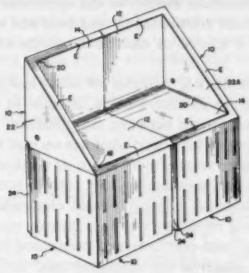
DISPLAY FIXTURE

Paul Belokin, Jr., R.R. #4, Hayward, Wis. 54843

Filed Feb. 14, 1977, Ser. No. 768,148
Int. Cl.[2] A47B *87/00*
U.S. Cl. 312—107 2 Claims

1. A display fixture unit comprising six identical units, four of said identical units having flat square sides and forming a base of said display fixture unit; two of said identical units each having right angular disposed abutting surfaces, and each of said two units defining a pair of coplanar edge surfaces interconnecting and diverging at right angles from each of the opposite ends of the corner edge, and

a planar isosceles right triangular wall interconnecting only one of the pairs of parallel coplanar edges and having its hypotenuse edge coplanar with said coplanar edges, the remaining triangular space being open; wherein said four



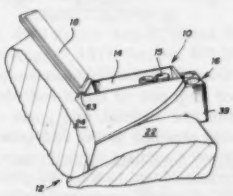
identical units having edge configurations defining face-to-face engaging surfaces disposed at a 45° angle to the plane of the square sides of said units.

4,106,829

PORTABLE MOTOR VEHICLE DRINK COOLER, CADDY AND ARMREST

Alvin J. Dolle, 5303 Fredricksburg Rd., Apt. 2, San Antonio, Tex. 78229, and Joseph H. Butler, Jr., 3102 Clearfield, San Antonio, Tex. 78230

Filed Apr. 11, 1977, Ser. No. 786,388
Int. Cl.[2] A47B *67/02*
U.S. Cl. 312—235 A 9 Claims



1. A portable motor vehicle cooler and armrest accessory dimensioned to rest on the benchseat in a motor vehicle, said accessory comprising:

outer side, front, rear and bottom walls defining a storage container, said rear wall contoured to fit and conform to the backrest of the benchseat, said bottom wall being contoured in a convex shape to fit and conform to the seat cushion of the benchseat to prevent said container from sliding therefrom while the vehicle is in motion;

a storage compartment defined by separate inner side, front, rear and bottom walls spaced from said outer walls, said inner walls substantially thermally insulated from said outer walls by an insulating medium;

a thermally insulated lid enclosing said storage compartment; and

material disposed substantially along the exposed upper side of said lid to provide an armrest for the occupant of the vehicle.

4,106,830

ROTATABLE SUPPORT STAND

Robert G. Sorgatz, Chicago, Ill. 60656

Filed Apr. 27, 1977, Ser. No. 791,436
Int. Cl.[2] H01R *39/00*
U.S. Cl. 339—8 R 10 Claims

1. A support stand for electrically energizable apparatus, comprising:

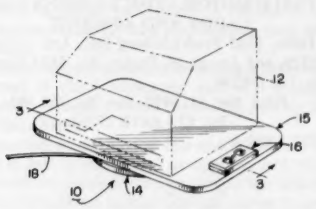
a base;

a platform disposed above said base and adapted to support the apparatus;

a grounded electrical outlet mounted on said platform for supplying electrical energy to the apparatus;

power line means connected to said base and adapted to be coupled to a source of electrical energy and to ground potential;

bearing means having a series of electrically conductive rollable bearing members being circular in cross section and being interposed between said platform and said base for supporting rollably said platform on said base to enable said platform to rotate freely about its vertical axis relative to said base in a continuous 360° path of rotation and for coupling electrical energy to said electrical outlet, said bearing means including an upper bearing race fixed to the underside of said platform and composed of electrically conductive material for engaging said members, and a lower bearing race fixed to the top surface of said base opposite said upper race and composed of electrically conductive material for engaging said bearing members to guide said bearing race along a continuous first closed loop path of travel relative to the stationary lower bearing race;



upper and lower stationary contact means disposed within said closed loop path of travel and composed of electrically conductive material, said upper stationary contact means being attached to the underside of said platform and said lower stationary contact means being attached to the top surface of said base of said platform;

a first pair of electrical conductor leads connected electrically at one of their ends to said power line means, the other ends of said conductor leads being connected individually and electrically to said lower bearing race and to said lower stationary contact means;

a second pair of electrical conductor leads connected individually and electrically at one of their ends to said uper bearing race and to said upper stationary contact means, the other ends of said second pair of electrical conductor leads being connected electrically to said outlet; and

ground conductor means mounted between said base and said platform and extending through a second closed loop enclosing the first closed loop, said conductor means including a stationary closed loop conductor and moving electrical contact means for contacting continuously said closed loop conductor to couple said electrical outlet to said power line means.

4,106,831

REVOLVING CABLE-TO-HOUSING CONNECTION

Werner Albrecht, Nuremberg, Fed. Rep. of Germany, assignor to Kabel-und Metallwerke Gutehoffnungshutte AG., Hanover, Fed. Rep. of Germany

Continuation of Ser. No. 651,189, Jan. 21, 1976, abandoned. This application Jul. 8, 1977, Ser. No. 813,820

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1975, 2501582

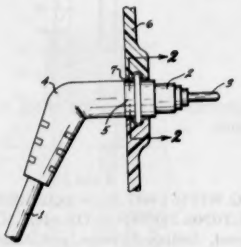
Int. Cl.[2] H01R *3/06*

U.S. Cl. 339—8 R **3 Claims**

1. Revolving connection of electrical cable conductors for passing through the relatively inflexible wall of a housing, comprising:

a socket member of a moldable plastic and being molded onto the cable thereby being mechanically connected to the conductors;

a pair of coaxial conductors in the socket member, mechanically and electrically connected to the said cable conductors, in addition to and independent from the mechanical connection for the cable to the socket member and being insulated from each other by a portion of the socket member being integral therewith;



a sleeve on said socket member being made of material having significant mechanical strength;

keying means integral with the socket member and inserted in the sleeve for firmly connecting the socket member to the sleeve and for impeding rotation of the sleeve relative to the socket member;

means in the housing defining a bearing for the sleeve and receiving said sleeve, the means permitting the turning of the socket with the sleeve about an axis coaxial to said conductors of the pairs; and

said sleeve and bearing means being constructed for axially retaining the sleeve in the bearing.

4,106,832

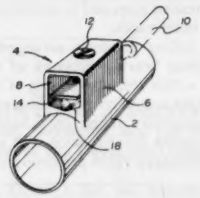
ELECTRICAL GROUNDING CLAMP

John Joseph Vincent Burns, P.O. Box 153, Tamworth, Ontario, Canada (K0K 3G0)

Filed Apr. 19, 1977, Ser. No. 788,819

Int. Cl.[2] H01R *3/06*

U.S. Cl. 339—14 L **8 Claims**



1. An electrical ground fixture comprising:

a metal pipe section, the section to constitute an intermediate section of a grounded pipe system, and

a securing means for a ground wire associated therewith, said securing means comprising:

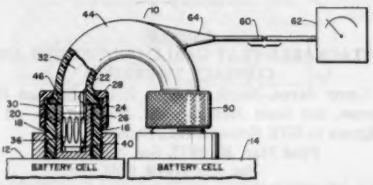
a metal casing adapted to receive the ground wire within, said casing being exterior to and an integral part of said pipe section, and

a clamp also part of the pipe section, operatively associated with and movable with respect to said casing, for securing the ground wire within said metal casing, whereby a ground path is provided between the secured ground wire and said casing and metal pipe section.

4,106,833
QUICK DISCONNECT INTERCELL BUSBAR FOR DEEP SUBMERGENCE BATTERIES

Jeffrey V. Wilson; Leroy W. Tucker; William D. Briggs, all of Camarillo, and Alan T. Inouye, Ventura, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 2, 1977, Ser. No. 830,241
Int. Cl.[2] H01R *11/00, 11/18, 11/26*
U.S. Cl. 339—29 B **4 Claims**



1. A quick disconnect intercell busbar for use on deep water submergence battery cells having insulated terminal posts comprising:

a. a conductor having first and second terminations;

b. a first male member connected to said first termination, said first member being configured to electrically mate with a female terminal post;

c. a second male member connected to said second termination, said second member being configured to electrically mate with a female terminal post;

d. waterproof insulating means for electrically insulating said conductor;

e. a first flange seal molded integral with said waterproof means for establishing a waterproof connection between a terminal post and said waterproof insulating means upon the mating of said first member with a terminal post, said first flange seal being disposed adjacent said first member;

f. a second flange seal molded integral with said waterproof means for establishing a waterproof connection between a terminal post and said waterproof insulating means upon the mating of said second member with a terminal post, said second flange seal being disposed adjacent said first member;

g. a first lock nut disposed adjacent said first flange seal such that, upon mating, said first lock nut may be screwed down around threaded portion of said female terminal post thereby effecting a waterproof seal between said waterproof insulating means and said female terminal post;

h. a second lock nut disposed adjacent said second flange seal such that, upon mating, said second lock nut may be screwed down around threaded portions of said female terminal post thereby effecting a waterproof seal between said waterproof insulating means and said female terminal post;

i. an insulated wire connected to said conductor for monitoring intercell voltage; and

j. means for providing strain relief between said insulated wire and said conductor.

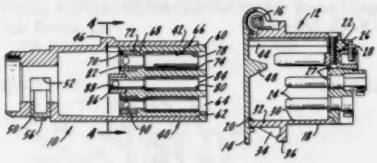
4,106,834
ELECTRICAL CONNECTOR

Charles Horowitz, Niles, Ill., assignor to Sloan Valve Company, Franklin Park, Ill.

Continuation-in-part of Ser. No. 701,085, Jun. 30, 1976, abandoned. This application May 27, 1977, Ser. No. 801,098
Int. Cl.[2] H01R *13/44*
U.S. Cl. 339—44 M **7 Claims**

1. In an electrical connector for use with tractor-trailer vehicles, a receptacle and plug, said receptacle including a housing, a cover pivotally attached to said housing and a plurality of contact pins mounted in said housing and extending toward said cover,

said plug including a housing, a plurality of axially extending passages in one end of said housing adapted for alignment with and reception of said contact pins when said plug is inserted in said receptacle, a first bushing positioned in each passage, an axially extending slot in each first bushing, and a key extending into each passage through the bushing slot for preventing rotation of each first bushing within its passage,

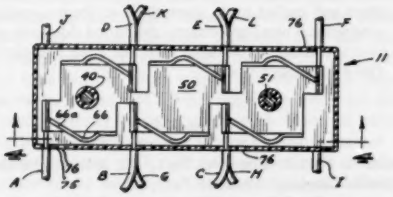


each passage including an enlarged portion, a second bushing positioned within each enlarged passage portion and positioned exteriorly of said first bushing, said second bushing exterior and enlarged passage portion cooperating to provide a non-rotatable mounting for said second bushing, a portion of said first bushing being positioned within said second bushing and being mechanically interlocked therewith, said second bushing including means to fasten an electrical wire thereto.

4,106,835
ELECTRICAL WIRE CONNECTING DEVICE FOR JUNCTION BOX

Herbert J. Kimm, 4950 France Ave. S., Edina, Minn. 55435

Filed Aug. 17, 1977, Ser. No. 825,264
Int. Cl.[2] H01R *9/12*
U.S. Cl. 339—95 D **2 Claims**



1. An electrical wire connecting device to be disposed into a junction box, having in combination,

a housing having a pair of superposed chambers therein,

an insulating barrier between said chambers,

a conductive member disposed within each of said chambers,

each of said conductive members comprising

a common base plate,

a plurality of right angled wall members struck from said base plate being disposed transversally of said housing and each having a medial angled channel thereacross,

a plurality of spring like tongue members struck from said base plate corresponding to each of said wall members and being disposed at right angles thereto and in a direction longitudinally of said housing,

said tongue members respectively having engagement with said wall members,

said tongue members having free end portions corresponding to the configuration of said channels of said wall members for mating engagement therewith to secure therebetween a conductive wire of no required minimum size, and

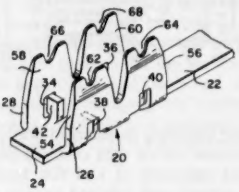
said tongue members respectively engaging said wall members at an angle in a direction away from the direction of the insertion of a wire therebetween.

4,106,836

CRIMP BARREL FOR THICK, FLAT, FLEXIBLE CABLE

John Carl Asick, Harrisburg, and Clifton Wesley Huffnagle, Camp Hill, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 14, 1977, Ser. No. 787,685
Int. Cl.[2] H01R *11/20*
U.S. Cl. 339—97 C **6 Claims**



1. An electrical contact crimp barrel for use with thick flat flexible cable, said crimp barrel comprising:

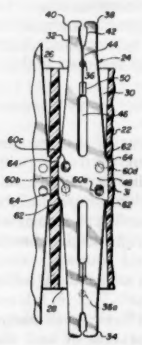
a substantially U-shaped cross section defined by a base web and a pair of integral spaced sidewalls, each sidewall having at least one aperture formed therein adjacent the base web, a lance struck from said base web adjacent each said aperture, said lance extending normal to both said base and the sidewalls and including a projection at the free end thereof extending at least partially into said adjacent aperture, each said sidewall having a transverse slot in the free edge thereof substantially aligned with the respective lance, whereby after crimping of said barrel onto a conductor of a flat flexible cable with the sidwalls straddling the conductor and bent inwardly towards each other and curled upon themselves to form a spring, the conductor is pinched between the curled sidewalls and the lances to follow a tortuous path and each said slot straddles a respective lance.

4,106,837

ELECTRICAL CONNECTOR

Edward S. Paluch, Elmwood Park, Ill., assignor to Reliable Electric Company, Franklin Park, Ill.

Filed Dec. 9, 1976, Ser. No. 749,062
Claims priority, application France, Jan. 12, 1976, 76 00558
Int. Cl.[2] H01R *9/08*
U.S. Cl. 339—98 **10 Claims**



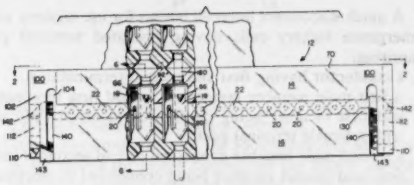
6. An electrical terminal comprising a flat generally planar conductive body having opposed ends with wire termination means thereat, each wire termination means comprising opposed cantilever arms that define a notch for receiving an insulated conductor and a slot for receiving a bare conductor part, the cantilever arms being on a common base constituting a part of the terminal that is intermediate the opposed ends, said common base having bosses projecting from the plane of the body, the bosses being four in number and defining substantially the corners of a rectangle, one pair of diagonally disposed bosses projecting in one direction and the other pair of diagonally opposed bosses projecting in the opposite direction.

4,106,838

STACKABLE FLAT CABLE CONNECTOR AND CONTACT THEREFOR

Max Leroy Jayne, North Warren; Robert Stephen Orbanic, Warren, and Scott Jack Lapraik, Pleasantville, all of Pa., assignors to GTE Sylvania Inc., Stamford, Conn.

Filed Mar. 30, 1977, Ser. No. 783,070
Int. Cl.[2] H01R *9/08*
U.S. Cl. 339—99 R **8 Claims**



1. A stackable connector assembly adapted to receive a flat cable having a plurality of parallel conductors, said connector assembly comprising:

a. a top body and a bottom body of insulative material, each having a confronting face portion, said top body mounting two rows of contacts, said bottom body adapted to position the flat cable whereby the top and bottom bodies are assembled together the contacts in each row will conductively engage in alternating succession the conductors in the flat cable,

b. the confronting face portions of the top and bottom bodies are provided with two rows of openings configured and sized to receive a portion of each contact with the offset portions of the contacts in one row facing one side and the offset portions of the contacts in the row facing in the opposite direction,

c. the contacts comprising a tubular body and an offset conductor receiving portion extending outwardly from said body, whereby contacts in one row have the offset portion facing towards one side and the contacts in the other row have their contacts facing the opposite direction,

d. the top and bottom bodies having openings to provide conductor pin access to the tubular body of each contact and further wherein these openings are in alignment from row to row and top to bottom, whereby the connector assembly may be plugged into an array of upstanding conductor pins, thereby interconnecting the cable conductors with the conductor pins.

4,106,839

ELECTRICAL CONNECTOR AND FREQUENCY SHIELDING MEANS THEREFOR AND METHOD OF MAKING SAME

Earl A. Cooper, Los Angeles, Calif., assignor to Automation Industries, Inc., Los Angeles, Calif.

Continuation of Ser. No. 708,476, Jul. 26, 1976, abandoned. This application Sep. 12, 1977, Ser. No. 832,717
Int. Cl.[2] H01R *13/54, 13/06*
U.S. Cl. 339—143 R **14 Claims**

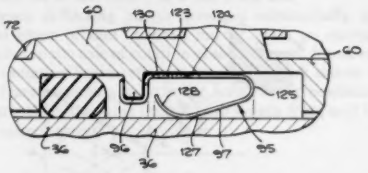
1. Means for shielding an electrical connector against inter-

fering frequencies, the connector including plug and receptacle means, each having shell members relatively movable along an axis into and out of mating engagement, comprising:

an annular member including

a band having a cylindrical surface seated against the internal surface of one of said shells;

means connected with one edge portion of said band for securing the annular member to said one shell;



and a plurality of folded resilient fingers connected with the other edge portion of said band and in converging relation to said axis for biased pressure contact with said internal surface of said one shell and for biased pressure contact with other of said shells;

said resilient folded fingers having adjacent edges spaced apart to provide minimal openings between said fingers.

4,106,840

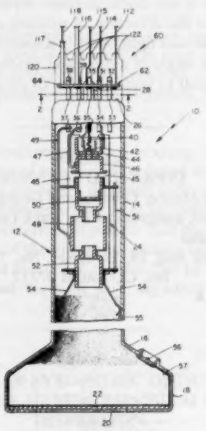
TUBE TERMINAL CONNECTOR ASSEMBLY

Charles H. Tyson, Lansdale, Pa., assignor to Raytheon Company, Lexington, Mass.

Filed Jul. 5, 1977, Ser. No. 813,039

Int. Cl.[2] H01J *5/50*

U.S. Cl. 339—145 R **11 Claims**



1. An electron tube terminal connector assembly comprised of:

an electron tube including an evacuated envelope;

a plurality of spaced terminal members sealed into the envelope and having respective outer portions extended outwardly therefrom;

printed circuit means mounted on respective outer portions of the terminal members for restricting forces applied to the terminal members, and including a dielectric substrate provided with electrical conduit means permanently connected mechanically and electrically to respective outer portions of the terminal members for making selective electrical connections to the terminal members in a spaced controlled manner; and

wire conductor means permanently connected mechanically and electrically to the electrical conduit means for making external electrical connections to selected terminal members of the tube.

4,106,841

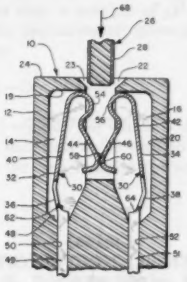
ELECTRICAL CONNECTOR FOR PRINTED CIRCUIT BOARDS

Daniel P. Vladic, Berwyn, Ill., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Mar. 11, 1977, Ser. No. 776,932

Int. Cl.[2] H01R *13/50*

U.S. Cl. 339—176 M **14 Claims**



1. A connector comprising:

housing means adapted to receive a male connector therein, and

electrical contact means including at least one pair of opposing, laterally movable contact members for receiving and electrically contacting said male connector therebetween and having electrically isolated terminal base portions, each said contact member including first and second contact portions spaced longitudinally from a fixed terminal base portion about which said member is laterally movable, said second contact portions of each said pair of members being biased against each other to maintain electrical continuity therebetween independent of said male connector until said male connector is electrically contacted by said first contact portions, said first and second contact portions being spaced from said fixed terminal base portions such that lateral movement of opposing first contact portions of each pair of members in response to insertion of said male connector therebetween decreases the bias force between said biased second contact portions to permit ready separation thereof in response to continued insertion of said male connector.

4,106,842

ELECTRICAL CONTACT AND CONNECTOR

John Eugene Benasutti, Oil City, Pa., assignor to GTE Sylvania Incorporated, Stamford, Conn.

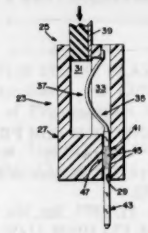
Filed Sep. 23, 1976, Ser. No. 725,728

Int. Cl.[2] H01R *9/16*

U.S. Cl. 339—221 R **11 Claims**

1. An electrical connector comprising a housing having at least one opening therein, an electrical contact including a contact portion and a body portion adjoining said contacting portion, the aforesaid housing openig defined by a wall, a portion of said wall carrying a plurality of irregular-shaped

particles whereby when the contact body portion is inserted in said opening the irregular-shaped particles will engage the



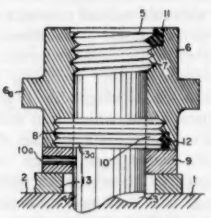
contact body and cut thereinto for retention of said contact in said housing.

4,106,843

DEVICE FOR ESTABLISHING ELECTRIC CONTACT PRESSURE

Erwin Salzer, Waban, Mass., assignor to Gould Inc., Newburyport, Mass.

Filed Sep. 7, 1976, Ser. No. 721,084
Int. Cl.[2] H01R *9/18*
U.S. Cl. 339—232 **7 Claims**



1. A device for establishing electrical contact pressure between a pair of mutually engaging current-carrying contact members including

(a) a contact member having a contact surface;

(b) a stud projecting from and affixed to said contact member, said stud having an external screw-thread at the end thereof remote from said contact member;

(c) a drive-nut mounted on said stud and having a first screw-thread cooperatively engaging said screw-thread on said stud and further having a second screw-thread;

(d) a driven nut slidably mounted on said stud cooperatively engaging said second screw-thread;

(e) said screw-thread on said stud and said screw-threads on said drive nut and on said driven nut being oriented in such a way that the axial movements of said driven nut relative to said stud is the sum of the axial movements of said drive nut relative to said stud plus the axial movements of said driven nut relative to said drive nut; and

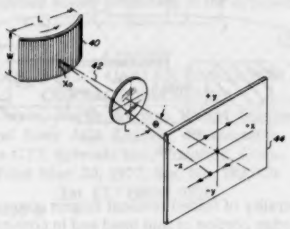
(f) means precluding rotation of said driven nut around said stud in response to rotation of said drive nut around said stud.

4,106,844

LASER SCANNING SYSTEM UTILIZING COMPUTER GENERATED HOLOGRAMS

Olof Bryngdahl, and Wai-Hon Lee, both of Cupertino, Calif., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 590,190, Jun. 25, 1975, abandoned.
This application Feb. 28, 1977, Ser. No. 772,603
Int. Cl.[2] G02B *27/17*
U.S. Cl. 350—6.2 **4 Claims**



1. A laser scanning system for scanning a coherent light beam across a surface comprising:

means for generating a coherent light beam,

an optical grating positioned such that an elemental portion of said optical grating is illuminated by said coherent light beam, and

means for rotating said optical grating about an axis of rotation such that said light beam successively illuminates different elemental portions of said optical grating,

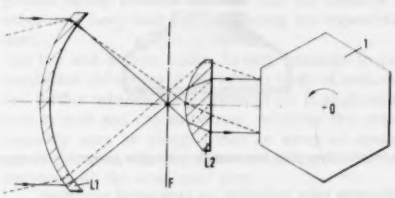
said optical grating being computer generated and having a wavefront structure with fringes having a non-linear distance of separation in a direction radial to said axis of rotation and a non-linear distance separation in a direction tangential to the direction of rotation of said optical grating such that said light beam is scanned completely over a desired scan angle in a direction having at least a component tangential to said direction of rotation of said optical grating.

4,106,845

INFRA-RED SCANNER

William Thomas Moore, London, and George Heftman, Pinner, both of England, assignors to The Rank Organisation Limited, London, England

Filed Aug. 16, 1976, Ser. No. 714,492
Int. Cl.[2] G02B *27/17*
U.S. Cl. 350—6.6 **12 Claims**



1. An optical scanning system for making successive line scans of a scene, comprising in combination:

a radiation detector,

a regular rotary polygon having flat external reflective faces,

an afocal optical system substantially free of optical field curvature for directing radiation from a scene to be scanned in a substantially parallel beam onto each successive face of the rotary polygon,

a flat frame scanning mirror arranged for rotational oscilla-

tions about an axis perpendicular to the axis of rotation of the polygon to effect a frame scan of slower speed than the line scan effected by the rotary polygon, and

a relay optical system interposed between the rotary polygon and the frame scanning mirror, the relay optical system comprising:

a. a concave imaging mirror arranged with its centre of curvature substantially coincident with the centre of each polygon face when the latter is reflecting radiation into the mirror at the centre of a line scan, and

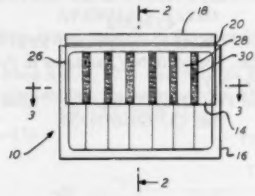
b. a beam deflecting mirror arranged substantially at the focal plane of said concave mirror, with an elongation parallel to the axis of rotation of the polygon, for directing the radiation beam reflected by the imaging mirror onto the frame scanning mirror, the latter being positioned at substantially the same optical path length from said imaging mirror as said polygon face.

4,106,846

TELEVISION COLOR BAR MATCHING DEVICE

Morton S. Russin, 32 Windmill La., New City, N.Y. 10956

Filed Nov. 15, 1976, Ser. No. 741,563
Int. Cl.[2] H04N 9/62
U.S. Cl. 358—10 **9 Claims**



1. A device for adjusting color television receivers wherein such receivers are used in cooperation with a system which provides, upon the screen of the receiver, a predetermined colored pattern of predetermined dimensions, the device comprising:

a housing; and

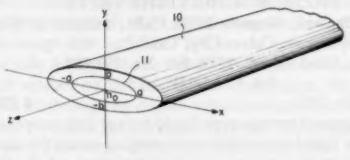
a mask, in combination with said housing, said mask comprises a plurality of translucent colored segments secured to said housing for being disposed over said screen, said segments being dimensioned so as to conform to at least a part of the predetermined pattern and to, simultaneously, leave a portion of the generated pattern uncovered by said mask, such that the color pattern can be compared with itself as viewed through said segments and upon the screen.

4,106,847

NONCIRCULAR SYMMETRIC OPTICAL FIBER WAVEGUIDE HAVING MINIMUM MODAL DISPERSION

Jacques Alexis Arnaud, Colts Neck, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 7, 1976, Ser. No. 720,982
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.31 **2 Claims**



1. An optical fiber waveguide comprising a core surrounded by a layer of cladding material, the refractive index of said layer n_c being less than n_o the value of the index of refraction at the center of the core, and the index of refraction n in said core is graded in accordance with the following equation:

$$n^2 = n_o^2(1-N)$$

where N is the relative phase index equal to 0 at the center of said core and equal to 2Δ at the core-cladding interface, Δ being equal to $1/2(1-n_c^2/n_o^2)$, characterized in that the relative index N has values at the coordinates x and y with respect to the core center given by the following equation:

$$h(x,y) = \exp \int_{2\Delta}^{N} [(1+\sqrt{1-2\Delta})\bar{n} - N]^{-1} dN$$

where $h(x,y)$ is any arbitrary homogeneous function of degree 2 in x and y other than a multiple of (x^2+y^2), and N is a relative group index approximately given in terms of N by the following equation:

$$\bar{N} = [N + (S_o - S)/n_o^2]/(1+S_o/n_o^2),$$

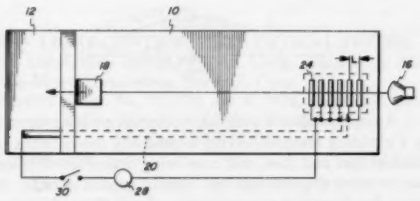
S being equal to $[-(\frac{\lambda}{4})dn^2/d\lambda]$ which is determined by measurements on the materials to be used to obtain the various values of n within the core, and S_o is the value of S at the core center.

4,106,848

ELASTOMER WAVE GUIDE OPTICAL MODULATORS

Esther M. Conwell, Rochester; Dorian Kermisch, Penfield; James C. Maher, Sodus; Gustav R. Pfister, and Richard L. Schank, both of Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 10, 1975, Ser. No. 621,312
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.14 **3 Claims**



1. An optical modulator comprising

(a) an elastomer waveguide which is comprised of materials selected from the group consisting of thin films of cross-linked dimethyl polysiloxane and cross-linked phenylmethyl polysiloxane, the film being supported by a rigid substrate, the waveguide having a given cross-sectional dimension and being adapted to propagate light; and

(b) an electric field means for impressing a field across the waveguide to change its cross-sectional dimension so that light propagating therethrough is modulated.

4,106,849

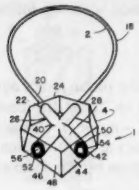
FIBER OPTIC SEAL

Lorin R. Stieff, P.O. Box 263, Kensington, Md. 20795

Filed Oct. 18, 1976, Ser. No. 733,177
Int. Cl.[2] G02B 5/16
U.S. Cl. 350—96.24 **20 Claims**

1. Fiber optic seal apparatus comprising a block, first and second pathways crossed within the block, the pathways having openings in spaced relationship on facial areas of the block, bundle holding means connected to the block for holding an

optic fiber bundle end inserted in each pathway with portions of the fibers near one end of the bundle threaded between



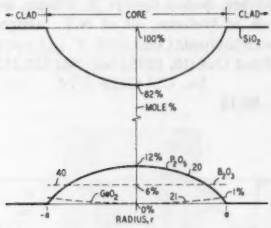
portions of the fibers near the opposite end of the bundle in random arrangement within the block with a medial portion of the bundle passing through an object to be sealed.

4,106,850

OPTICAL FIBER WITH GRADED INDEX CORE AND PURE SILICA CLADDING

Enrique Alfredo José Marcatili, Rumson, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 4, 1977, Ser. No. 784,290
Int. Cl.² G02B *5/14*
U.S. Cl. 350—96.31 **5 Claims**



1. An optical fiber waveguide comprising a core surrounded by a cladding material having a generally lower index of refraction than said core, said core being composed of silica and two or more dopants that are radially graded in order to improve the dispersive characteristics of said fiber, characterized in that said core includes a third dopant appearing with uniform concentration through said core, and said cladding is substantially pure silica.

4,106,851

FILM EXAMINING WITH DIFFUSE AND SPECULAR ILLUMINATION

Philip S. Considine, Woburn, and Robert E. Whitney, Burlington, both of Mass., assignors to Eikonix Corporation, Burlington, Mass.

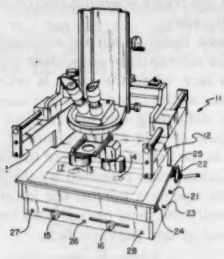
Filed Sep. 22, 1976, Ser. No. 725,396
Int. Cl.² G02B *21/06*
U.S. Cl. 350—87 **10 Claims**

1. Viewing apparatus comprising,

diffusion plate means for providing a diffuse background formed with at least one aperture for transmitting specular illumination,

a first source of light for illuminating said diffusion plate means,

a second source of specular light,



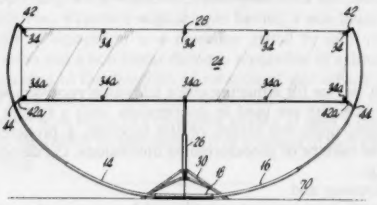
and means for positioning said source of specular light for directing specular light energy through said aperture.

4,106,852

PROJECTION SCREEN SUPPORT STRUCTURE

Edward A. Chasins, Peekskill, N.Y., assignor to Producers Row Inc., New York, N.Y.

Filed Feb. 22, 1977, Ser. No. 771,046
Int. Cl.² G03B *21/56*
U.S. Cl. 350—117 **7 Claims**



1. A projection screen support structure comprising a projection screen defining a plurality of upper and lower support openings, an extendable center support pole fastened to one of said upper support openings, a support socket located near the base of said center support pole, a pair of telescoping side support poles each fastened at its upper end to a pair of said end upper support openings, each fastened also to an associated pair of said end lower support openings and each further held by said support socket, said structure adapted and arranged to spread said screen between said side support poles.

4,106,853

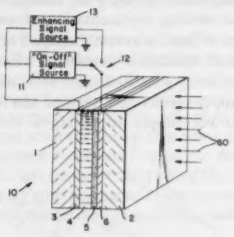
METHOD AND APPARATUS FOR INCREASING CONTRAST RATIO OF THE STORED IMAGE IN A STORAGE MODE LIGHT VALVE

Donald D. Boswell, Granada Hills, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Jul. 28, 1976, Ser. No. 709,490
Int. Cl.² G02F *1/13*
U.S. Cl. 350—333 **8 Claims**

1. An improved storage-type liquid crystal cell comprising a storage-type liquid crystal layer and imaging means for causing emulsive scattering storage in selected regions of the liquid crystal cell, the improvement comprising means for applying a

signal across selected regions of the liquid crystal layer said signal having an rms amplitude below the amplitude threshold



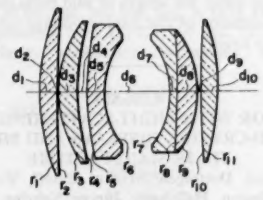
and a frequency above the maximum scattering frequency of the storage-type liquid crystal layer.

4,106,854

PHOTOGRAPHIC LENS SYSTEM HAVING A LARGE APERTURE RATIO

Toru Fujii, Hino, Japan, assignor to Olympus Optical Co., Ltd., Japan

Filed Apr. 5, 1977, Ser. No. 784,795
Claims priority, application Japan, Apr. 6, 1976, 51-37850
Int. Cl.[2] G02B *11/30*
U.S. Cl. 350—176 **6 Claims**



1. A photographic lens system having a large aperture ratio comprising a first positive meniscus lens component having a convex surface on the object side, a second positive meniscus lens component having a convex surface on the object side, a third negative meniscus lens components having a convex surface on the object side, a fourth negative meniscus cemented doublet component having a convex surface on the image side and a fifth positive lens component, and said lens system satisfying the following conditions:

(1) $0.22f \leqq d6 \leqq 0.27f$
(2) $1.74 \leqq n3, n4$
(3) $\nu 3, \nu 4 < 30$
(4) $-2.5f \geqq r8 \geqq -70f$
(5) At least, either $\nu 1$ or $\nu 2$ is 40 and below
(6) $n1, n2, n5, n6 > 1.7$
(7) $0.25/f \leqq |1/r4| - |1/r5| \leqq 0.4/f$

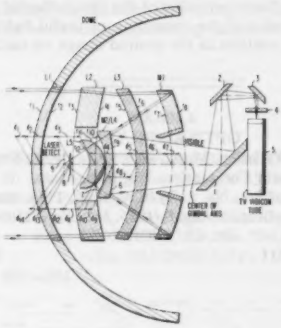
wherein the reference symbol $d6$ represents thickness of the airspace formed between the third and fourth lens components, the reference symbols $r4$, $r5$ and $r8$ designate radii of curvature on the image side surface of the second lens component, the object side surface of the third lens component and the cemented surface on the fourth lens component, the reference symbols $n1$ through $n6$ denote refractive indices of the respective lens elements, the reference symbols $\nu 1$ through $\nu 4$ represent Abbe's numbers of the first lens component, the second lens component, the third lens component and the object side element of the fourth lens component and the reference symbol f designates focal length of the lens system as a whole.

4,106,855

LENS ELEMENT INCORPORATING NARROW BANDPASS FILTER AND USABLE IN DUAL MODE

Bryan H. Coon, Seminole County, Fla., assignor to Martin Marietta Corporation, Orlando, Fla.

Continuation-in-part of Ser. No. 604,365, Aug. 13, 1975, abandoned. This application May 12, 1977, Ser. No. 796,245
Int. Cl.[2] G02B *5/10, 5/28*
U.S. Cl. 350—196 **15 Claims**



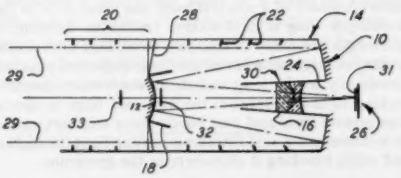
1. A dual-mode catadioptric objective system comprising a positive meniscus lens convex to the object, a Mangin mirror concave to the object and spaced from said positive lens, a negative menisćus lens having a thin film dielectric filter on its one surface for separating visible light from laser light, and a thin film dielectric background blocking filter on its other surface, latter lens serving as a secondary mirror for visible light and serving to focus such visible light behind said Mangin mirror, latter lens also being transparent to laser light, and means for focusing laser light on a selected object.

4,106,856

STRAY LIGHT CONTROL IN AN OPTICAL SYSTEM

Richard Constantine Babish, Wilton, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Continuation of Ser. No. 702,778, Jul. 6, 1976, abandoned. This application Nov. 14, 1977, Ser. No. 851,100
Int. Cl.[2] G02B *17/08*
U.S. Cl. 350—199 **1 Claim**



1. A solid catadioptric photographic system comprising, in combination, a primary mirror for receiving rays of light from a field of interest and reflecting them to a spaced secondary mirror that, in turn, reflects the rays through a central hole in the primary mirror to sensitive material disposed on a focal plane behind said primary mirror, said primary mirror and said secondary mirror being mounted in a tube, an inner primary baffle means mounted adjacent said central hole, a conical secondary baffle mounted adjacent the parameter of said secondary mirror, a series of baffles inwardly directed from the walls of said tube between said primary and said secondary mirrors, and a series of inwardly directed forebaffles mounted on the walls of said tube extending from said secondary mirror towards the field of interest, means for treating the surfaces surrounding the path of the rays of light through the system to

substantially reduce specularly the diffusely reflected stray light, a centrally located dark, obscuration disposed adjacent the front of said secondary mirror for intercepting light rays reflected from said sensitive materials towards said secondary mirror to prevent the reflection from said secondary mirror of said light reflected by the sensitive material from forming a secondary image on said sensitive material, the reflection from said sensitive material including a diffuse component and a specular component, the size of said dark obscuration being a function of the flare correction of the light reflected from said sensitive material and the vignetting of useful light, thereby improving the contrast in the desired image on said sensitive material.

4,106,857

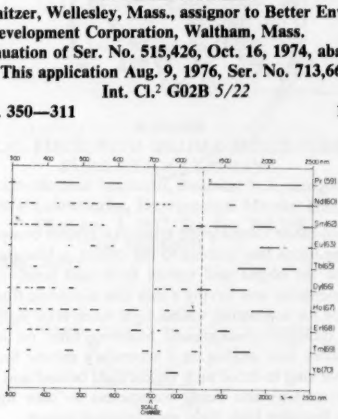
OPTICAL FILTERS

Elias Snitzer, Wellesley, Mass., assignor to Better Environmental Development Corporation, Waltham, Mass.

Continuation of Ser. No. 515,426, Oct. 16, 1974, abandoned. This application Aug. 9, 1976, Ser. No. 713,660

Int. Cl.[2] G02B *5/22*

U.S. Cl. 350—311 **12 Claims**



1. An optical filter comprising a rare earth-containing material positioned across an optical path through said filter, said material containing tripley charged ions of rare earth atoms with partially filled shells of *4f* electrons, said rare earth atoms having first and second absorption resonances arising from absorption of light with rearrangement of electrons in the *4f* shell, said rare earth atoms being disposed in said optical path in sufficient number to make said filter opaque near center wavelengths of each of said resonances, absorption in the short wavelength wing of said first resonance defining a long wavelength boundary of a spectral band and absorption in the long wavelength wing of said second resonance defining a short wavelength boundary of said pass band, said filter including a blocking component transmissive in said spectral pass band and immediately to the long and short wave sides thereof while blocking light transmission through said filter in spectral regions remote from said pass band where said rare earth material is transmissive, said filter transmitting light throughout said band while blocking it elsewhere in the spectrum.

4,106,858

LIQUID CRYSTAL DISPLAY APPARATUS

Bruno Dargent, Grenoble, and Jacques Robert, St. Egreve, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

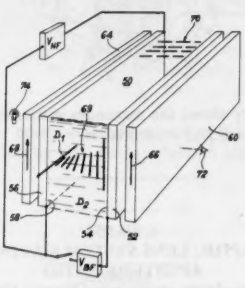
Filed Apr. 18, 1977, Ser. No. 788,468

Claims priority, application France, Apr. 30, 1976, 76 12996

Int. Cl.[2] G02F *1/13*

U.S. Cl. 350—332 **5 Claims**

1. An analog liquid crystal display apparatus comprising a liquid crystal film band inserted between a first conductive electrode and a second resistive electrode, a first voltage source connected between said first and second electrodes, a second power supply connected between the two ends of the resistive electrode, the liquid crystal then having a first optical state on a first part of the band and a second optical state on the remainder of the band, the length of said first part being a function of the value of the two voltages applied and thus constituting an analog representation of one of the voltages when the other is fixed, wherein the liquid crystal is of the type having a critical relaxation frequency which is either a load relaxation frequency or a dielectric relaxation frequency, the first power supply supplying a voltage at a first frequency and the second power supply supplying a voltage at a second



frequency, said two frequencies being on either side of said critical frequency, whereby one of the voltages is then a display voltage and the other is a voltage which inhibits the display, the liquid crystal then having a first optical state over that part of the band where the display voltage prevails over the inhibition voltage and a second optical state over the remainder of the band, the length of said parts constituting the analog representation of the display voltage when the inhibition voltage is fixed.

4,106,859

REFLECTOR WITH LIGHT-SCATTERING SURFACE FOR LIQUID-CRYSTAL DISPLAYS AND METHOD FOR THEIR MANUFACTURE

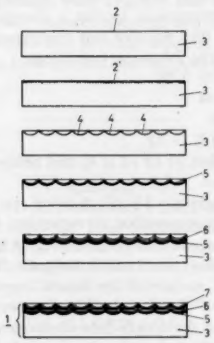
Rino Doriguzzi, Dottingen; Markus Egloff, Wettingen; Meinolph Kaufmann, Fislisbach; Jurgen Nehring, Umiken, and Terry J. Scheffer, Wettingen, all of Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed May 7, 1976, Ser. No. 684,251

Claims priority, application Switzerland, Jun. 27, 1975, 8375/75

Int. Cl.[2] C09K *3/34*; G02F *1/01*; C03C *17/00*; B05D *3/12*

U.S. Cl. 350—338 **18 Claims**



1. A liquid crystal display device comprising a twisted nematic liquid electro-optical crystal cell and a reflector, the reflector comprising a layer carrier provided with depressions of bubble-like structure and a thin, compared to the depth of the depressions, highly reflective layer applied upon the

depression-comprising surface of the layer carrier, the layer carrier comprising a material selected from the group consisting of glass, plastic and metal and the reflective layer comprising a metal selected from the group consisting of silver, aluminum, gold and copper.

9. A method for the manufacture of a reflector with a light-scattering surface for liquid crystal displays operated in reflection having a layer carrier comprising a material selected from the group consisting of glass, plastic and metal provided with depressions and having a thin highly reflective layer comprising a metal selected from the group consisting of silver, aluminum, gold and copper evaporated upon the depression-provided surface of the layer carrier comprising the steps of: generating depressions by roughening and subsequently etching the surface of the layer carrier and evaporating said metal on said surface.

18. A method for manufacturing a reflector with a light-scattering surface for liquid crystal displays operated in reflection having a layer carrier comprising a material selected from the group consisting of glass, plastic and metal provided with depressions and having a thin highly reflective layer comprising a metal selected from the group consisting of silver, aluminum, gold and copper applied upon the depression-provided surface of the layer carrier comprising the steps of applying a highly reflective metal layer on the layer carrier and generating depressions in the highly reflective metal layer and in the layer carrier by impressing the highly reflective metal layer and the layer carrier with a stamping device.

4,106,860

LIQUID-CRYSTAL CELL

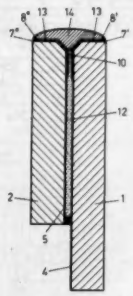
Meinolph Kaufmann, Niederwil, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Continuation of Ser. No. 503,169, Sep. 3, 1974, abandoned. This application Nov. 1, 1976, Ser. No. 737,779

Claims priority, application Switzerland, Sep. 7, 1973, 12865/73

Int. Cl.[2] **G02F** *1/13*

U.S. Cl. 350—343 **2 Claims**



1. A liquid-crystal cell comprising:

two glass cell plates coated on the inner surfaces thereof with electrodes and containing a liquid crystal substance therebetween,

spacing elements separating said cell plates, and integrally bonded to said cell plates so as to hermetically seal said cell plates together,

electrically conducting material connecting said electrodes of said cell plates,

said spacing elements being so arranged with said cell plates that between said cell plates and said elements there is defined a hole for introducing said liquid-crystal substance,

contact films formed of aluminum provided by vapor deposition on the end surfaces of each of said cell plates in the region of said hole, said contact films extending over said end surfaces of said cell plates to the inner surfaces thereof and contacting said electrodes for forming enlarged electrical contact surfaces whereby said electrodes may be reliably interconnected.

a solderable metal coating of Cr-Cu-Au, or Cr-Ni-Au layers, disposed by vapor deposition over said contact films and said spacing elements extending from one of said cell plates across said spacing elements to the other of said cell plates so as to surround said hole, and

a conductive sealing substance applied to said contact films across said end surfaces for sealing said hole hermetically and for electrically connecting said electrodes.

4,106,861

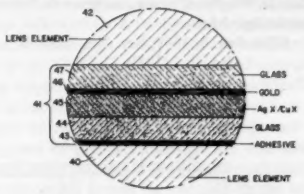
REDUCED HAZE PHOTOCHROMIC SYSTEMS

William R. Brewer, Hingham; Kenneth S. Norland, Belmont, and Richard F. Wright, Acton, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jul. 12, 1976, Ser. No. 704,699

Int. Cl.[2] **G02B** *5/23*

U.S. Cl. 350—354 **23 Claims**



1. In a photochromic article comprising:

(a) a first continuous layer of material substantially impermeable to halogen selected from the group consisting of chlorine, bromine and iodine;

(b) a continuous layer comprising silver ions, copper ions and halide ions, said halide ions selected from the group consisting of chloride, bromide and iodide; and

(c) a second continuous layer of material substantially impermeable to the halogen comprising said halide ion; said layer of silver ions, copper ions and halide ions being between said layers of material substantially impermeable to the halogen; the improvement wherein said article comprises a continuous layer of a metal in a quantity effective to substantially reduce photochromic haze, said layer of metal being positioned between said first layer of halogen impermeable material and said layer of silver ions, copper ions and halide ions.

4,106,862

ELECTROCHROMIC DISPLAY CELL

Michel Lucien Bayard, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 12, 1976, Ser. No. 741,271

Int. Cl.[2] **G02F** *1/00*

U.S. Cl. 350—357 **7 Claims**

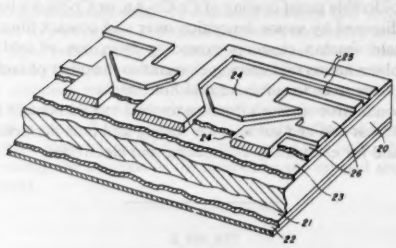
1. An electrochromic display cell comprising:

a structural support substrate member having two major surfaces comprising a dry solid electrolyte material electrically insulative but conductive to sodium ions;

a thin display electrode layer of approximately 1 micron thickness of WO_3 applied to one major surface of said substrate;

a thin counter-electrode layer of approximately 1 micron

thickness of Na_xWo_3, y being about 0.3, applied to the other major surface of said substrate; and



electrical contacts to said display electrode layer and said counter-electrode layer.

4,106,863

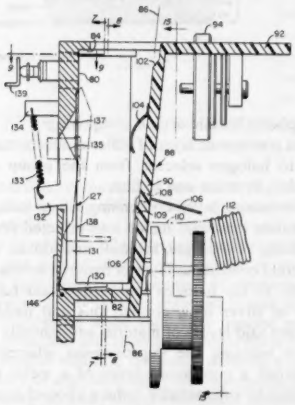
CASSETTE RECEIVING WELL STRUCTURE FOR PHOTOGRAPHIC VIEWING APPARATUS

Donald T. Scholz, Wayland, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 3, 1977, Ser. No. 756,430

Int. Cl.[2] G03B *23/02*

U.S. Cl. 352—72 **5 Claims**



1. In apparatus for viewing by projection a photographic film strip contained within a substantially thin film cassette which has a pair of opposed major wall surfaces connected and spaced apart by a peripheral wall substantially defining the thickness of the cassette and having an opening thereinf for projection of transparent image frames contained on the film strip, the improvement comprising:

means for receiving the cassete and operatively positioning the cassette within said apparatus including means defining an elongated opening slightly wider than the thickness of the cassette through which the cassette can be slidably inserted into said apparatus, a wall surface extending inwardly of said apparatus from said opening substantially perpendicular to the plane of said opening, the end of said appartus wall surface adjacent said opening terminating at a position spaced laterally from said opening, an inwardly facing abutment surface adjacent said opening and extending away therefrom in the direction of said end of said apparatus wall surface, means extending from said wall surface for actuating components within the cassette, means for guiding the portion of the cassette first entering said opening over and past said cassette component actuating means, means on the opposite side of the cassette as it enters said apparatus from said apparatus wall surface for engaging one major surface of the cassette and resiliently urging the cassette towards said apparatus wall surface so that the other major wall surface of the cassette will untimately rest against said apparatus wall surface with said cassette component actuating means operably engaging components of the cassette, and means for automatically engaging said cassette as it is inserted through said opening to resiliently urge said cassette in a direction outwardly of said apparatus through said opening, said last stated means and said means for resiliently urging the cassette against said apparatus wall surface in combination serving to seat a portion of the cassette's peripheral wall against said abutment surface when the cassette has been fully inserted into said apparatus through said opening; and

selectively operative means for exerting a force against the other major wall surface of the cassette to effect the displacement of the portion of the cassette seated against said abutment surface into alignment with said opening against the force exerted on the cassette by said means for resiliently urging the cassette against said apparatus wall surface, said means for urging the cassette outwardly of said apparatus through said opening being operative at such time to eject at least a portion of the cassette through said opening.

4,106,864

MOTION-PICTURE CAMERA WITH DIAPHRAGM CONTROL SYSTEM HAVING FADEOVER CAPABILITY

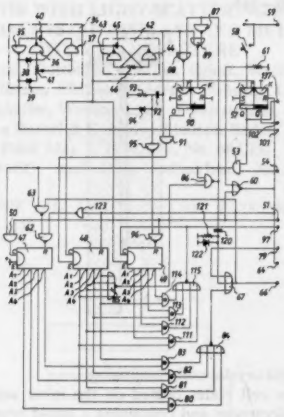
Norbert Burgermann, Munich, Fed. Rep. of Germany, assignor to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed Aug. 25, 1977, Ser. No. 827,776

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1976, 2638403

Int. Cl.[2] G03B *21/36*

U.S. Cl. 352—91 C **18 Claims**



1. In a motion-picure camera, in combination, an adjustable diaphragm; light-sensitive negative-feedback diaphragm control means operative for automatically adjusting the diaphragm setting in dependence upon scene light, including an adjusting motor coupled to the diaphragm, a film-transport motor operative for transporting film and means for generating frame pulses indicative of the number of transported frames; pulse-generating means operative for generating a pulse train; gating means having an input connected to receive pulses from the pulse-generating means and including selecting means for selecting the gating duration of the gating means to provide at the output of the gating means a reference pulse packet consisting of a selected number of pulses; first counting means con-

nected to receive the frame pulses and operative for counting in dependence thereon; second counting means; comparator means connected to the first and second counting means for generating a program-step-change signal when the counts on the first and second counting means are the same; program-step counting means having an input connected to the comparator means and operative for counting program steps in dependence upon program-step-change signals furnished by the comparator means; means operative for initiating a sequence of program steps, including means for causing the second counting means to register the pulses of the reference pulse packet; means operative at the end of each program step in response to a program-step-change signal from said comparator means for resetting the first counting means for performance of another counting cycle for the next program step; logic circuit means connected to the program-step counting means, connected to the negative-feedback diaphragm control means and connected to the film-transport motor and operative for implementing fade-out and fade-in operations by altering the balance of the negative-feedback control means and controlling the energization of the film-transport motor in dependence upon the counts registered by the program-step counting means; and adjusting-speed control means connected to the second counting means and to the negative-feedback diaphragm control means, operative for causing the extent to which the adjusting motor alters the diaphragm setting during the course of each counting cycle of the first counting means to be constant irrespective of the number of pulses in the reference pulse packet registered by the second counting means, by automatically setting the adjusting speed of the adjusting motor to a value inversely related to the number of pulses in the reference pulse packet.

4,106,865

MOTION-PICTURE CAMERA PROGRAMMED FOR FADEOVER EFFECTS

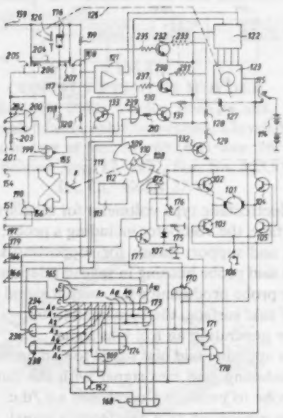
Norbert Burgermann, Munich, Fed. Rep. of Germany, assignor to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed Sep. 1, 1977, Ser. No. 829,816

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1976, 2640466

Int. Cl.[2] G03B *21/36*

U.S. Cl. 352—91 C **10 Claims**



1. In a motion-picture camera of the type including a film transport motor, an adjustable diaphragm, and light-sensitive negative-feedback diaphragm control means operative for adjusting the diaphragm setting in dependence upon scene light, including a stepper motor coupled to the diaphragm, and a control circuit operative for operating the stepper motor by generating stepper-motor drive pulses and including components forming a time-constant circuit operative for establishing the repetition frequency of the stepper-motor drive pulses, a novel arrangement for producing fadeover effects, the arrangement comprising, in combination, means for establising *m* different repetition frequencies for the stepper-motor drive pulses, the first through the *m*th frequencies being successively higher, including *m* semiconductor switches each connected to the time-constant circuit for changing the time-constant thereof; program-step counting means operative for receiving program-step-change signals and counting in dependence thereon, the program-step counting means being a 1-out-of-*n* binary counter having *n* outputs of which successive single ones carry a signal in response to successively received program-step-change signals, the *n* outputs including first, second and third output groups respectively constituting a fade-out output group, a rewind output group and a fade-in output group, the number of outputs in each group being equal to *m;* means for applying program-step-change signals to the input of the program-step counting means in dependence upon film transport effected by the film transport motor; logic circuit means connected to the outputs of the program-step counting means, connected to the negative-feedback diaphragm control means and connected to the film transport motor and operative in dependence upon the count registered on the program-step counting means for effecting a fade-out followed by a limited film rewind followed by a fade-in, by imbalancing the negative-feedback diaphragm control means and controlling the operation of the film transport motor; and connecting means connecting respective ones of the first through the *m*th semiconductor switches to respective ones of the first through the *m*th outputs of the fade-out output group, and connecting respective ones of the first through the *m*th semiconductor switches to respective ones of the *m*th through the first outputs of the fade-in output group, for controlling the conduction of the switches in dependence upon the signals carried on the outputs of the fade-out and fade-in output groups and causing the repetition frequency of the stepper motor drive pulses to increase during the course of a fade-out and decrease during the course of the subsequent fade-in.

4,106,866

IMAGE PROJECTION SYSTEM

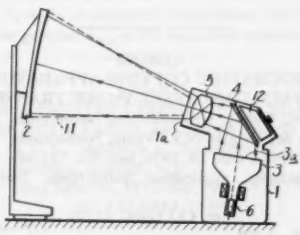
Satoshi Shimada, Yokohama, and Norio Itoh, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 18, 1975, Ser. No. 597,088

Claims priority, application Japan, Jul. 25, 1974, 49-88620

Int. Cl.[2] G03B *21/26*

U.S. Cl. 353—29 **4 Claims**



1. An apparatus for projecting images on a viewing screen comprising image reproducing means having an image display panel and being operative to produce on said display panel an image of at least one color, projection lens means for projecting said image from said display panel onto the viewing screen, and colored light source means for superimposing on the image projected onto said viewing screen colored light of a hue different from each said color of the image produced by said image reproducing means.

4,106,867
SLIDE PROJECTOR FOR BOTH MAGAZINE AND SINGLE SLIDE PROJECTION

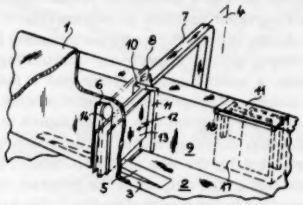
Reinhard Sobotta, Braunschweig, Mascherode, Fed. Rep. of Germany, assignor to Rollei-Werke Franke & Heidecke, Brunswick, Fed. Rep. of Germany

Filed Aug. 30, 1977, Ser. No. 829,083

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1976, 7627989[U]

Int. Cl.[2] G03B *21/00*

U.S. Cl. 353—114 **5 Claims**



1. A photographic slide projector comprising means forming a magazine channel for guiding a slide magazine for movement to bring successive slides thereof to a slide changing plane, said guiding means including a magazine guide wall, a slide lifting ramp for lifting successive slides in the magazine as they approach the slide changing plane, a slide changing device for moving successive individual slides from the slide magazine to a projection position and back from projection position into the slide magazine, and an accessory for holding a single slide in position to be moved by the same slide changing device into projection position and back again to the accessory when it is preferred to project single slides rather than slides from a magazine, said accessory comprising a front plate and walls collectively forming a compartment for holding a single slide, said compartment being shaped to be placed crosswise in said magazine channel at said slide changing plane, said compartment having a top edge which is open for manual insertion and removal of single slides and having a side edge facing said projection position which is open for movement of a slide out of and into said compartment to and from projection position by action of said slide changing device, said magazine guide wall of said projector having a recess for releasably receiving and holding said front plate of said accessory to position said compartment on said slide changing plane, said accessory further including a resilient element for resiliently engaging a side of said lifting ramp when said front plate is seated in said recess.

4,106,868
ELECTROGRAPHIC COPYING APPARATUS WITH SURFACE-TO-SURFACE IMAGE TRANSFERS

Petrus J. M. Ophey, Grubbenvorst, Netherlands, assignor to OCE-van der Grinten N.V., Venlo, Netherlands

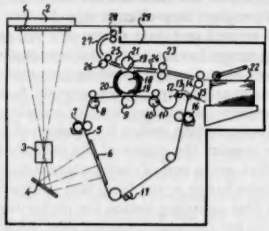
Filed Oct. 29, 1976, Ser. No. 737,049

Claims priority, application Netherlands, Nov. 5, 1975, 7512987

Int. Cl.[2] G03G *15/00*

U.S. Cl. 355—3 TR **6 Claims**

1. In an electrographic copying apparatus including a movable electrographic surface for carrying and transferring a powder image to an intermediate surface moving in pressing contact with it and means for moving a sheet of copy paper in contact with the intermediate surface for transferring the image from the latter surface to the sheet of copy paper, the improvement which comprises said intermediate surface having at least one receding portion each of which recedes away from the intermediate surface so that said portion cannot make contact with the electrographic surface, and means whereby a said receding surface portion is positioned opposite to said electrographic surface so that the electrographic surface and



the intermediate surface make no contact with each other when no image transfer is to be effected.

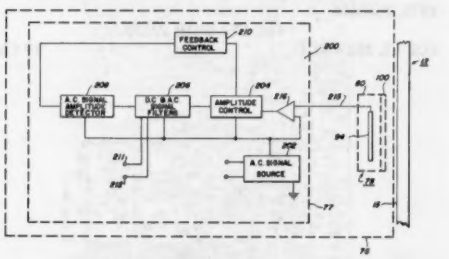
4,106,869
DISTANCE COMPENSATED ELECTROSTATIC VOLTMETER

Robert F. Buchheit, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 26, 1976, Ser. No. 744,910

Int. Cl.[2] G03G *21/00*; G01R *19/00*

U.S. Cl. 355—3 R **6 Claims**



1. In an electrostatic type voltmeter for measuring the potential on a surface, the voltmeter including a probe, a housing for said probe, and support means for supporting said probe together with said probe housing in spaced relationship with said surface, the probe producing a d.c. output signal reflecting the potential of said surface, the combination of:

means for generating an a.c. bias signal

means for applying said bias signal to said probe housing and for combining said bias signal with the output signal of said probe to produce a combined a.c./d.c. signal;

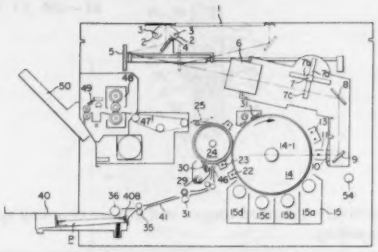
means for generating an a.c. reference signal; and

amplitude adjusting means for regulating the signal amplitude of said combined a.c./d.c. signal in response to a change in the amplitude of the a.c. component of said combined a.c./d.c. signal relative to said a.c. reference signal to maintain a preset relationship between the a.c. component of said combined a.c./d.c. signal and said a.c. signal whereby to compensate said probe output signal for a change in spacing between said probe and said surface.

4,106,870
COLOR ELECTROPHOTOGRAPHIC METHOD AND APPARATUS

Eiichi Kondo, Kawasaki; Hajime Katayama; Toru Takahashi, and Yutaka Komiya, all of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 20, 1974, Ser. No. 535,083
Claims priority, application Japan, Dec. 28, 1973, 49-918
Int. Cl.[2] G03G *15/01*
U.S. Cl. 355—4 **24 Claims**



1. A color electrophotographic apparatus wherein color resolved light images of an original are exposed onto a photosensitive medium to form a series of separate color resolved electrostatic latent images, comprising:

a movable photosensitive medium;

voltage charge applying means for applying a voltage charge to said photosensitive medium, and means for exposing the photosensitive medium with color resolved light images of an original to form successive color resolves latent images thereon; a plurality of adjustable voltage control means for varying the voltage of the charge applying means according to each color resolved light image;

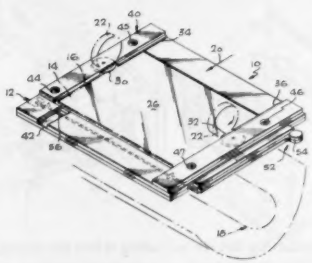
means for simultaneously adjusting said plurality of voltage control means relative to each other for varying the relationship between the voltage charges applied to the photosensitive medium; and

programming means for selectively coupling individual ones of said voltage control means to said charge applying means during the formation of said successive color resolved latent images.

4,106,871
CONTACT PRINTER HOLDER

William E. Roberts, Palos Verdes Penn., Calif., assignor to Addressograph Multigraph Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 652,635, Jan. 26, 1976. This application Aug. 12, 1977, Ser. No. 823,912
Int. Cl.[2] G03B *27/04*
U.S. Cl. 355—99 **14 Claims**



1. A microfiche contact copier holder for holding a microfiche master under a copy sheet, and where the copy sheet is moved by transport rollers that can bear against opposite sides of the copy sheet when it lies on the master, comprising:

a base which includes a light-transmitting plate; and

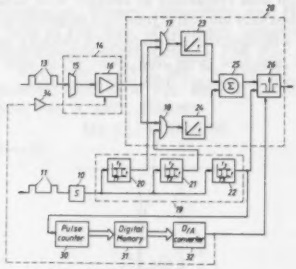
a pair of separator means mounted on opposite sides of said frame, for lying under the pheripheral edges of said transport rollers and between the copy sheet and master;

said separator means constructed to apply low drag to said copy sheet when it moves thereby, and being thin to enable substantially all of the area of said master and copy sheet lying between said separator means to be pressed into intimate contact.

4,106,872
CLOUD ALTITUDE MEASURING APPARATUS AND METHOD

Sven-Erik Soderstrom, Vesteras, Sweden, assignor to ASEA Aktiebolag, Vesteras, Sweden

Filed Mar. 9, 1977, Ser. No. 776,063
Int. Cl.[2] G01C *3/08*
U.S. Cl. 356—4 **2 Claims**



1. Means for measuring cloud altitude, comprising a transmitter for emitting light pulses towards a cloud, a receiver located adjacent the transmitter for detecting light reflected from the cloud, said receiver having a sensitivity, said sensitivity with increasing distance from the receiver, first decreases to a certain distance, and at greater distances from said certain distance said sensitivity increases, and said sensitivity is determined from the function:

$$K/K_{max} = C \cdot 1/A_h \cdot 1/T_h (h/h_{max})^2$$

where

K is the sensitivity of the receiver, K_{max} is the maximum sensitivity of the receiver, C is a constant, A_h is a complex function of height, T_h is an atmosphere transmission factor, h is the height above ground, h_{max} is the maximum measuring height.

4,106,873
DISK PRINTER INKING MECHANISM

John Edward Drejza, Endwell, and Joseph Vincent Riley, Vestal, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 14, 1977, Ser. No. 777,257
Int. Cl.[2] B41J *27/06*
U.S. Cl. 400—470 **2 Claims**

1. In a printer having,

a platen,

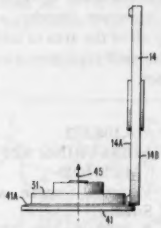
a constantly rotating print disk,

a carrier for moving said print disk across said platen, said carrier having a home position at one end of said platen, said carrier being returned to said home position when a line of printing is complete and prior to the initiation of another line of printing,

an ink roll adapted to apply ink to said print disk, the improvement comprising,

a friction disk attached to one side of said ink roll, said friction disk having a diameter larger than said ink roll,

means for moving said ink roll away from said print disk when said carrier is returned to said home position, whereby there is no wear on said ink roll while said carrier is in home position,



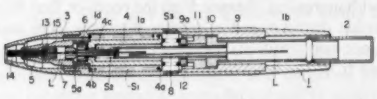
said friction disk remaining in contact with said print disk even when said ink roll is removed from contact with said ink roll whereby, there is no relative velocity between said ink roll and said print disk even when said ink roll is removed from contact with said print disk.

4,106,874

MECHANICAL PENCIL

Osamu Torii, Kyoto, Japan, assignor to Ancos Co., Ltd., Osaka, Japan

Filed Nov. 29, 1976, Ser. No. 745,751
Int. Cl.[2] B43K *21/22, 21/20*
U.S. Cl. 401—67 **8 Claims**



1. A mechanical pencil, comprising:

(a) an elongated hollow main body member defining a mouth opening at one end thereof,

(b) a mouth piece movable in and out of the mouth opening,

(c) a chuck receiver axially secured to one end of the mouth piece to define an annular recess therebetween and positioned within the body member,

(d) a chuck sleeve slidably positioned in the annular recess,

(e) a lead gripping chuck positioned within the chuck sleeve,

(f) an elongated lead case secured to one end of the chuck and slidably positioned within the body member and the chuck receiver,

(g) first spring means for urging the chuck into lead gripping engagement with the chuck sleeve and the chuck receiver inwardly with respect to the mouth opening,

(h) a push operated mechanism slidably positioned within the body member for locking the mouth piece, chuck receiver, chuck receiver, chuck sleeve, chuck and lead case in retracted and extended positions with respect to the mouth opening,

(i) second spring means positioned between the chuck receiver and the mechanism for urging the two apart, and,

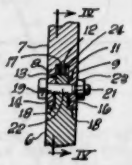
(j) a secured to the lead case push cap for implementing the longitudinal movement of the lead case and mechanism.

4,106,875

EXPLOSIVELY-SEPARATED TONGUE AND GROOVE JOINT

Harvey R. Jewett, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 23, 1977, Ser. No. 836,167
Int. Cl.[2] F16B *1/00*
U.S. Cl. 403—2 **10 Claims**



1. Explosively separated tongue and groove coupling apparatus comprising:

a groove member having laterally spaced leg portions forming a longitudinally-extending tongue-receiving groove,

a tongue member fitted into said groove,

at least one laterally-extending bolt means securing said members,

explosive means disposed between said members, and

means for detonating said explosive means,

both of said members being provided with aligned bolt-receiving holes and at least one of said members being formed with a plurality of slots disposed longitudinally of said member in close proximity to a bolt-receiving hole,

said explosive means operatively spanning the length of said plurality of slots and being spaced from said slots and bolt holes by a beam-like web portion of the tongue member,

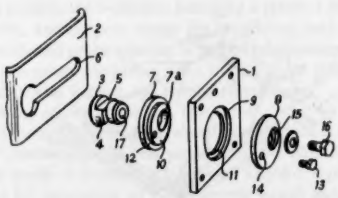
detonation of said explosive means collapsing said web portion adjacent each of said slots for opening each bolt hole and said detonation further providing a force for driveably separating said members with each bolt freely passing through its opened bolt hole.

4,106,876

DOOR MOUNTINGS

Geoffrey Robinson Tregoning, London, England, assignor to Westinghouse Brake and Signal Company Limited, London, England

Filed Nov. 29, 1976, Ser. No. 745,866
Claims priority, application United Kingdom, Dec. 20, 1975, 52278/75
Int. Cl.[2] F16B *1/00*
U.S. Cl. 403—4 **6 Claims**



1. A door mounting device including when assembled, a first door part having an aperture, a mounting member rotatably mounted within said aperture, a second part having a slot, a further mounting member slideably mounted in said slot, said further mounting member extending from said slot to rotatably engage in an eccentric aperture in said mounting member, and

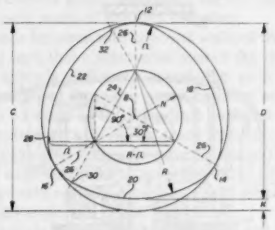
means for locking said mounting member against rotation in said aperture.

4,106,877

LOBULAR PIN

Peter J. Ferguson, South Dartmouth, Mass., assignor to Research Engineeering & Manufacturing, Inc., New Bedford, Mass.

Filed Sep. 16, 1976, Ser. No. 723,765
Int. Cl.[2] F16B *19/00*
U.S. Cl. 403—14 **4 Claims**



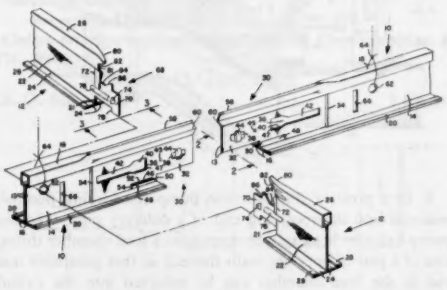
1. A pin having a pilot point with a uniform width throughout 360°, said pin having a longitudinal axis and a body containing a cross section of arcuate polygonal lobular configuration with an odd number of arcuate sides and intermediate circumferentially spaced arcuate lobes, the radii of the lobes each being substantially less than the radii of said sides, said cross section being of uniform width throughout 360° , the body width being greater than the width of said pilot point, the lobes having peaks which are equal distance from a said longitudinal axis and which peaks are adapted to engage the wall of a bore to enhance the grip between the pin and the wall of the bore at regions that are essentially localized at the lobes and with at least portions of said arcuate sides between the peaks being regions of stress relief between the pin and the bore, and wherein the imaginary circle that circumscribes said peaks is centered on said axis and wherein Z is defined as the diameter of the circle having an area equal to the area of said cross section, and wherein D is defined as said body width, the ratio Z/D being within the range of 0.9998 to 0.98863.

4,106,878

FIRE-RATED CEILING GRID CROSS JOINT

Paul H. Jones, Willow Grove, Pa., assignor to National Rolling Mills Company, Malvern, Pa.

Filed Feb. 4, 1977, Ser. No. 765,733
Int. Cl.[2] F16B *7/22*
U.S. Cl. 403—28 **14 Claims**



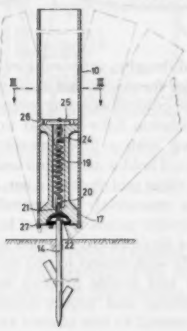
1. For use in a fire-rated suspended ceiling grid, a main beam comprising an elongated web with laterally offset flanges at one edge and a bulb at the other edge whereby said main beam has substantially an inverted T cross section, and coupling means integral with the main beam for connecting the end of said beam to the end of another similarly constructed main beam, said coupling means including a tongue at the end of said main beam, said tongue including portions of each of said web and of said bulb that are offset laterally relatively to the main portions of said web and bulb, with the said offset portion of said bulb being crushed to reduce its lateral dimension whereby said tongue may be brought into close parallel overlapping relation to the tongue of the coupling means of said another similarly constructed main beam with the main portions of said web and bulb and said flanges of said main beam and of such other similarly constructed main beam in longitudinal alignment, said coupling means further including retaining means to retain said tongue in such overlapping relationship with the tongue of the coupling means of such another main beam while allowing relative longitudinal movement of said beams.

4,106,879

KNOCKOVER ROADWAY MARKER POST

Bruno Diedershagen, Wissen, Schonstein, and Hans Gubela, Cologne, both of Fed. Rep. of Germany, assignors to Gubela Strassenausrustungs-GmbH, Cologne, Fed. Rep. of Germany

Filed Nov. 3, 1977, Ser. No. 848,087
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1976, 2650940; Feb. 3, 1977, 2704496
Int. Cl.[2] E01F *9/00*
U.S. Cl. 404—10 **20 Claims**



1. A knockover roadway marker post comprising:

a base fixable to the ground and having an upper surface provided with an upwardly tapering formation;

an upright post element having a lower post end formed with a downwardly open recess fittable over said formation with same inside said recess and said lower post end engaging said upper surface; and

a spring braced between said post element and said base and biasing same together with said lower post end bearing on said upper surface and said formation inside said recess.

4,106,880

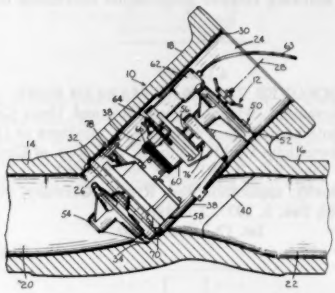
PORTABLE FIELD MACHINE FOR CUTTING, GRINDING AND LAPPING VALVE SEATS

Ronald J. Anders, Raleigh, N.C., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Division of Ser. No. 701,958, Jul. 1, 1976, Pat. No. 4,050,836.
This application Feb. 14, 1977, Ser. No. 768,313
The portion of the term of this patent subsequent to Sep. 27, 1994, has been disclaimed.
Int. Cl.[2] B23B *35/00, 1/00*
U.S. Cl. 408—1 R **1 Claim**

1. The method of finishing the valving seat of a valve attached to an associated fluid line without the removal of said valve therefrom using a portable valve seat finishing machine,

said valve having a valve body containing an internal valving chamber terminating in an annular valve seat having a profile adapted for sealing engagement by a valving member translatable along the control axis of said valve chamber, said valve seat finishing machine having a stationary housing having axially spaced sections interconnected by a shaft member, positioning means carried by said housing, comprising the steps of: positioning said portable valve seat finishing machine within said valving chamber, positioning said shaft member with respect to said control axis by contacting the interior surface of said valving chamber with said positioning means, tool holder means operatively attached to said shaft means, positioning said tool holder means within said valving chamber with respect to said annular valve seat, said tool holder means including a valve seat profile means and a carrier means rotat-



ably supported thereby, supporting rotatably and reciprocally said tool holder means on said shaft member for axial movement along the control axis and rotation thereabout, preventing relative rotation between said housing and said carrier means, rotating with a drive means operatively connected between said tool holder means and said carrier means said tool holder means about said shaft member, feeding axially by a first feeding means operatively connected between said housing and said tool holder means, said tool holder means, said carrier means and said drive means as a unit along said shaft member, feeding radially with respect to said tool holder means and said shaft member said profile forming means by a second feed means, positioning said profile forming means axially and radially with respect to said control axis for performing finishing operations on said valve seat.

4,106,881

ENCAPSULATED MOTOR COMPRESSOR FOR REFRIGERATORS

Jorgen Christian Stannow, and Hans Jürgen Tankred, both of Sonderborg, Denmark, assignors to Danfoss A/S, Nordborg, Denmark

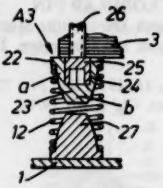
Filed Apr. 11, 1977, Ser. No. 786,421

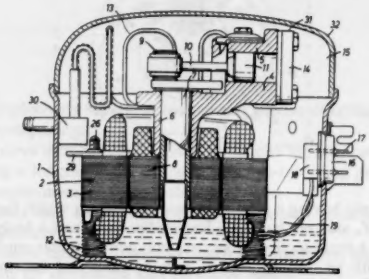
Claims priority, application Fed. Rep. of Germany, Apr. 21, 1976, 2617388

Int. Cl.[2] F04B *35/00*

U.S. Cl. 417—363 **1 Claim**

1. A motor compressor assembly for refrigerators comprising a casing, an integrated motor and compressor unit in said casing having a lower motor part and an upper compressor part, said motor part having a stator which includes a stack of laminations, said stack of laminations having a generally rectangularly shape periphery with four bevelled corners, stator bolts extending upwardly through said stack of laminations at the four corners thereof with the heads of said bolts projecting downwardly from the lower surface of said stack of laminations, resilient mounting means for supporting said unit, said mounting means including four generally cone shaped spring retaining abutment members attachable from below to the four corners of said stack of laminations, said abutment members having recesses for receiving said bolt heads and collars which extend outwardly beyond said bevelled corners of said stack of laminations, said collars being abuttingly engageable with the inner surface of said casing during lateral movement of said





unit to provide bumper protection for said unit, and spring means including helical springs which respectively engage said collars.

4,106,882

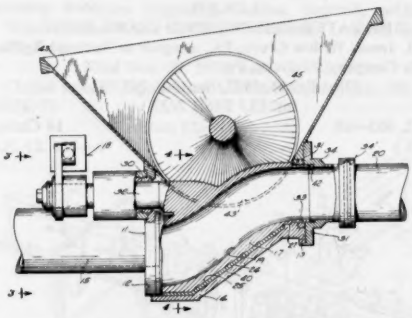
POSITIVE DISPLACEMENT PUMP FOR SEMI-FLUID MATERIALS

Eugene L. Sherrod, Via Massimo d'Azeglio 2, 20052 Monza, Italy

Filed Jul. 25, 1975, Ser. No. 598,991

Int. Cl.[2] F04B *7/00*

U.S. Cl. 417—517 **17 Claims**



1. In a positive displacement pump for forcing pumpable material into the receiving end of a delivery pipe, wherein a pump cylinder has a mouth opening to a feed chamber through one of a pair of opposite walls thereof, so that pumpable material in the feed chamber can be inducted into the cylinder during the retraction stroke of its piston, wherein a hole in the other one of said walls of the feed chamber opens to the receiving end of the delivery pipe, wherein a tubular swivel valve is mounted in the feed chamber between its said opposite walls for oscillation about a fixed axis that is coaxial with the receiv-

ing end of the delivery pipe and offset from the axis of the mouth of the pump cylinder, between pump charging and discharging positions wherein said swivel valve has a substantially S-curved material conveying passage extending lengthwise therethrough with its outlet end coaxial with the rotation axis of the valve and at all times in communication with the receiving end of the delivery pipe, and its inlet end offset from said rotation axis to register with and receive material expelled from the mouth of the pump cylinder upon oscillation of the swivel valve in timed relation with the reciprocation of the pump piston, the improvement which resides in:

A. all of that portion of said material conveying passage which is curved along the length thereof being between said opposite walls of the feed chamber;

B. the distance between said opposite walls of the feed chamber being such that a substantial area of the surface of said passage extends obliquely across the path of material being discharged from the pump cylinder at an angle to said path so steep as to cause such material to impose a substantially high axial thrust force upon the valve;

C. said swivel valve having an exterior surface for transmitting said axial thrust force upon the valve, which surface

(1) lies directly radially outward of said area with respect to the rotation axis of the valve,

(2) lies entirely within the feed chamber and substantially spans the distance between said opposite walls thereof,

(3) has its axially opposite ends offset from one another substantially the same distance as are the axially opposite ends of the material conveying passage,

(4) for its entire axial dimension is transversely arcuate, and

(5) on every plane normal to the rotation axis of the valve and intersecting said exterior load transmitting surface is uniformly concentric to said rotation axis, but with decreasing radii towards the outlet end of the swivel valve so that for its entire axial dimension said load transmitting surface is substantially part of a cone; and

D. the feed chamber having another wall with an inner surface shaped to conform to the sweep of said arcuate exterior load transmitting surface of the swivel valve as the swivel valve oscillates about its rotation axis and in every position of the swivel valve has an area thereof uniformly contiguous to every part of said arcuate load transmitting surface of the swivel valve, so that said wall of the feed chamber receives and bears the axial thrust imposed upon the swivel valve by the material being discharged from the pump cylinder.

4,106,883

DISTRIBUTING VALVE ON A HYDRAULIC ROTARY PISTON ENGINE

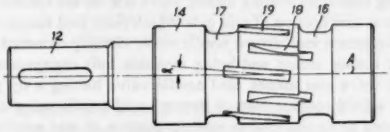
Gunnar Lyshoj Hansen, Nordborg, and Leif Viggo Sturlason, Sonderborg, both of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Feb. 25, 1977, Ser. No. 771,979

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1976, 2608887

Int. Cl.[2] F04C *15/02*

U.S. Cl. 418—61 B **2 Claims**



1. An expansible chamber rotary piston engine comprising meshing internal and external gears wherein one rotatable gear has rotatable and orbital movement relative to the other fixed gear to form expansible chamers, relatively rotatable and cooperable valve members connected respectively to said gears, said valve members having respective first and second sets of circumferentially arranged ports with each port in each set being sequentially aligned with each port in the other set upon relative rotation between said valve members, said valve members having cooperating cylindrically shaped surfaces in which said respective sets of ports are formed, the ports in each of said sets having at least one pair of generally parallel edges which are generally normal with respect to the direction of relative motion between said valve members, the ports in said first set having its said parallel edges orientated at the small angle relative to said parallel edges of the ports in the other of said sets, and said first set of ports having the circumferential spacing of the ports thereof alternately equal to and slightly larger than the width of the ports of said second set of ports so that each of said expansible chambers is completely closed off by said valve members upon reaching its largest volume.

4,106,884

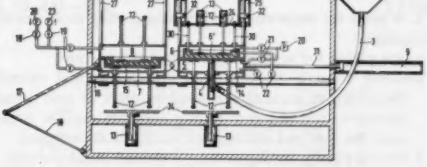
PRODUCTION OF ARTICLES OF FOAMED PLASTICS MATERIAL

Johann Friedrich Jegelka, Tannenstrasse 52, 6983 Kreuzwertheim, Germany

Filed Mar. 30, 1977, Ser. No. 782,615

Int. Cl.[2] B29C *3/02*

U.S. Cl. 425—345 **5 Claims**



1. A machine for producing articles of foamed plastics material in a two-stage process with transfer of the workpiece from a hot-preforming station to a cold final-forming station, comprising:

a frame;

a hot-preforming station in said frame having a two-part hot mould consisting of a first hot mould part and a second hot mould part;

first fluid cylinder means for moving said second hot mould part towards and away from said first hot mould part only in the direction of pressing;

a cold final-forming station in said frame having a two-part cold mould consisting of a first cold mould part and a second cold mould part; and

second fluid cylinder means for moving said second cold mould part of said final-forming station towards and away from said first cold mould part of said final-forming station only in a direction parallel to the direction of motion of said first fluid cylinder means;

said two first mould parts being coupled together and mounted to be capable of shifting at right angles to the direction of movement of said first and second fluid cylinder means under the influence of third fluid cylinder means,

control means for the cylinders,

such that the workpiece is first formed in the hot-preforming station when the first and second hot mould parts of the hot mould are aligned, the workpiece is then carried with the second hot mould part as the two parts are separated, the first parts of the hot and cold moulds are shifted to align the second part of the hot mould and the first part of the cold mould and transfer of the workpiece is effected

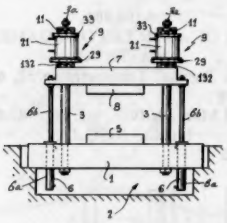
from one to the other, the first parts of the hot and cold moulds are again shifted to align the first and second parts of the cold mould and cold forming is effected, the workpiece is then carried by the second part of the cold mould as the two parts of the cold mould are separated, the first part of the cold mould is shifted out of alignment and the finished article is ejected from the second part of the cold mould.

4,106,885

HYDRAULIC MOULDING PRESSES

Pierre Poncet, 12 bis, rue Trarieux, Lyons, France (69003)

Filed Mar. 17, 1977, Ser. No. 778,525
Claims priority, application France, Mar. 31, 1976, 76 10352
Int. Cl.[2] B29F *1/06*
U.S. Cl. 425—450.1 **4 Claims**



1. A press for supporting and closing mating mold portions, comprising:

a first platen for supporting a first mold portion;

multiple columns fixed to said first platen and extending therefrom in parallel relationship, each of said columns having a free end and having multiple annular grooves near the free end and spaced axially of the column;

a second platen for supporting a second mold portion, the second platen having multiple holes through it receiving said columns, and the second platen being reciprocable on said columns with respect to said first platen;

long stroke mold pre-closing rams connected between said first and second platens and operative when pressurized to displace the second platen on said columns with respect to the first platen;

a short stroke mold-clamping ram at each column, each short stroke ram comprising a cylinder containing a reciprocable piston, the piston being tubular and having the free end of an associated column extending through it, and the cylinder being connected to the second platen; and

a main locking means carried by the piston at each column and operable, when the long stroke rams have pre-closed the mold portions, to enter a groove and lock the piston to the column, whereby pressurizing of the cylinder will exert a mold closing stroke in a direction to displace the cylinder and connected platen to mate the mold portions.

4,106,886

PARISON PICKERS WITH VARIABLE SPACING

Nickolas N. Sokolow, Cheshire, Mass., assignor to Beloit Corporation, Beloit, Wis.

Filed Jun. 21, 1977, Ser. No. 808,705
Int. Cl.[2] B29D *23/03*
U.S. Cl. 425—526 **10 Claims**

1. In a blow molding assembly including:

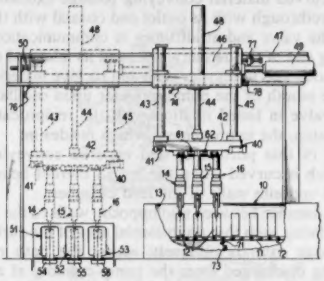
an oven,

a plurality of molds spaced from said oven,

a conveyor means arranged to carry parisons in equally spaced relation through said oven, and

a carriage having picker means between arranged to grasp a plurality of parisons from said oven and deliver them to said molds, the improvement which comprises:

an adjustable displacement means operating on selected ones of said picker means to vary the spacing between



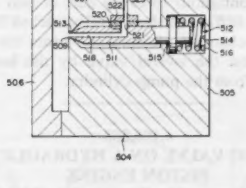
said selected ones and an adjoining picker means in traveling from said oven to said molds.

4,106,887

APPARATUS FOR INJECTION MOLDING SYNTHETIC RESIN MATERIALS

Akio Yasuike, Yokohama; Hiroshi Kataoka, Tokyo; Tutomu Fujikawa, Yamato, and Naoto Suzuki, Kawasaki, all of Japan, assignors to Asahi-Dow Limited, Tokyo, Japan

Filed Apr. 12, 1977, Ser. No. 786,939
Claims priority, application Japan, Feb. 21, 1977, 52-17137
Int. Cl.[2] B29F *1/08, 1/03*
U.S. Cl. 425—549 **6 Claims**

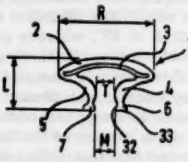


1. A mold assembly suitable for use in an injection molding machine having a nozzle for injection, comprising a body, at least one mold cavity in said body for receiving a synthetic resin from said injection molding machine; a sprue in said body for establishing a direct connection to the nozzle of said machine; at least one gate opened to the interior of said mold cavity; runner means connecting said sprue with said gate and being heated by heating means; valve seat means formed in said gate at that portion of said gate which faces said runner means; valve means including a needle valve slidably mounted within said runner means and being movable into engagement with said valve seat means, said needle valve having a tip portion and a fluid passage formed through said needle valve which is opened at its one end in said tip portion of said needle valve which faces the interior of said mold cavity when said needle valve is engaged by said valve seat means, the other end of said fluid passage being connected to a connecting passage formed in said body, said connecting passage being in turn connected to a source of pressurized fluid; and actuator means in said mold assembly for engaging said needle valve with said valve seat means to close said gate.

4,106,888
TIRE MOLDING APPARATUS

Giovanni Calori, Milan, Italy, assignor to Industrie Pirelli S.p.A., Milan, Italy

Filed May 25, 1976, Ser. No. 689,850
Claims priority, application Italy, Jun. 13, 1975, 24326 A/75
Int. Cl.[2] B29H 5/02; B29F 1/00
U.S. Cl. 425—577 7 Claims

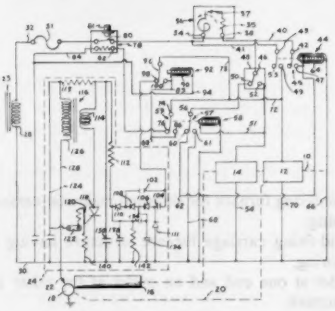


1. A mold for manufacturing a tire with tread, sidewalls and beads, said beads being essentially made of a plastomeric or elastomeric material, said mold comprising an outer envelope and an inner body associated to form a mold cavity of the desired shape of the tire, said inner body comprising a core made of radially displaceable sectors, characterized in that the inner body comprises at least two annular elements, an upper one and a lower one, which are separable from one another and from the core along the direction of the core axis, said elements having at least two surfaces which correspond to the tire surfaces disposed between the inner zone connecting the sidewalls to the beads and a part of the axially outer zone of the beads, said two annular elements originating the spreading out of the sidewalls of the tire when the annular elements are moved away from each other, and said inner body comprising means for blocking said annular elements with the core and with the outer envelope during the tire molding.

4,106,889
BURNER IGNITION SYSTEM

Jay R. Katchka, Cypress, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Nov. 19, 1976, Ser. No. 743,297
Int. Cl.[2] F23Q 9/08
U.S. Cl. 431—46 19 Claims



1. An ignition and control system for ignition of fuel discharged from a burner assembly including a main fuel burner having a fuel supply line connected thereto and a pilot burner to ignite fuel discharged from said main burner and having a pilot fuel supply line extending thereto, which comprises:

ignition means to ignite fuel discharged from said pilot burner;

first and second controlled valves for serial positioning in said main fuel supply line with means to connect said pilot fuel supply line to the fuel supply downstream of said first controlled valve;

condition sensing means to transmit a heating demand signal to said control system;

combustion detection means having cold and hot signal generation states to generate cold and hot signals, responsive to the absence or presence, respectively, of a flame at said pilot burner;

control means having an output signal to activate said first controlled valve into an open position and to activate said ignition means in response to receipt of said heating demand signal and said cold signal;

means to apply said hot signal to said second controlled valve to open said valve in response to receipt of said hot signal from said combustion detection means;

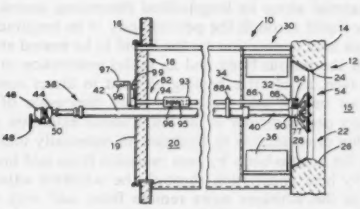
ignition control means having an output to inhibit operation of said ignition means in response to receipt of a hot signal from said combustion detection means; and

latching means, and means to apply said output signal of said igntion control means thereto, to maintain inhibition of said ignition means.

4,106,890
AIR DEFLECTOR

John Arthur Fulmer, Massillon, and David Judson Walker, Medina, both of Ohio, assignors to The Babcock & Wilcox Company, New York, N.Y.

Filed Mar. 7, 1977, Ser. No. 774,822
Int. Cl.[2] F23M 9/02
U.S. Cl. 431—184 1 Claim



1. In combination with a furnace wall having a circular port extending therethrough, the port being formed with inlet and outlet frusto-conical sections and a constricted section disposed therebetween, the inlet and outlet sections converging in the direction of the constricted section, a burner wall spaced from the furnace wall to form a windbox therebetween to which pressurized air is supplied, a fluid fuel burner including an air register of circular cross section disposed within the windbox and having a discharge end adjacent and opening to the inlet section of the port, the register being arranged to discharge a whirling stream of high velocity air through the port, a circular impeller disposed axially within and in radially spaced relation to the port, the impeller comprising a pair of axially adjacent plate members, each plate member having a hub, a plurality of laterally spaced segments extending outwardly from the hub, the segments being formed with openings defining a fixed free flow area therethrough, means including a shaft for rotating at least one of the plate members about its central axis to provide a first adjustable free flow area between said segments, means including a guide tube extending through each hub for moving the impeller longitudinally through the port to provide a second adjustable free flow area therebetween, means connecting each hub with the guide tube while accommodating rotation of at least one of the members with respect to the guide tube, the shaft including a pair of coaxial sections, a sleeve interconnecting the sections, one of the sections being fixedly connected to the sleeve, the other section being fitted with a guide pin, the sleeve being slotted to engage the pin and permit longitudinal movement between the pinned and fixed sections thereby allowing for adjustment of

the second free flow area independently of the first free flow area.

4,106,891
ELECTRICAL HEATING DEVICE

Hermann J. Schladitz, Plantschweg 74, Munich 60, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 534,432, Dec. 19, 1974, abandoned. This application Sep. 16, 1976, Ser. No. 723,982

Int. Cl.² F23D *11/44*

U.S. Cl. 431—208 **19 Claims**

1. An electric heating device for the heating or vaporization of a liquid, comprising; at least one elongated porous body having a small dimension perpendicular to its longitudinal extension, said porous body consisting of a felted mass of polycrystalline metal whiskers or metal-coated non-metal whiskers metallically interconnected at their point of contact, said porous body being enclosed between walls of heat-conducting material along its longitudinal dimension, means for passing the liquid through the porous body in its longitudinal direction, an inlet connection for the liquid to be heated at one end face of the porous body and an outlet connection at the other end face, an electric heating element in direct contact with at least one of said walls, the small dimension of the porous body perpendicular to its longitudinal extension providing a thin cross section to facilitate an essentially uniform heating of the porous body by heat radiation from said heated wall and by heat conduction through the whiskers adjacent said wall to the whiskers more remote from said wall, said body is of hollow cylindrical form and is arranged to be traversed by the fluid to be heated in the direction of its axis and two said walls are provided in the form of an inner tube and an outer tube bounding said hollow cylinder.

4,106,892
APPARATUS FOR HEAT TREATMENT USING DOWNWARDLY SWIRLING HOT GAS FLOW

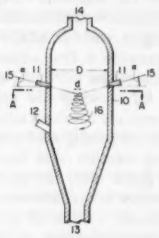
Toshikatsu Haga, and Saburo Hori, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Nihonbashi, Japan

Filed Dec. 1, 1976, Ser. No. 746,574

Claims priority, application Japan, Dec. 23, 1975, 50-173227[U]; Dec. 4, 1975, 50-143312; Mar. 10, 1976, 51-25013

Int. Cl.² F27B *15/00*

U.S. Cl. 432—58 **7 Claims**



1. An apparatus for the heat treatment of a bed of material including a vertically oriented, generally cylindrical furnace having an inlet for introducing the bed-forming material and an exhaust gas outlet at the top of the furnace, comprising:

a plurality of gas inlet nozzles in the furnace above the bed, said nozzles being oriented at a downward angle α between the axis of each nozzle and a horizontal sectional plane through the furnace defined by $0° < \alpha \leqq 30°$, and at a skew angle β between the axis of each nozzle and a horizontal line tangent to the furnace circumference at the point where the nozzle axis intersects the furnace wall defined by $45° \leqq \beta \leqq 85°$, whereby gas streams introduced through said nozzles collectively produce a downwardly swirling flow having a truncated conical configuration to thereby confine and contain particles of the material splashed or blown up out of the bed, the inside diameter of the upper portion of the furnace, above the nozzles, being greater than that of the lower portion of the furnace containing the nozzles, and said upper and lower portions being connected by an inclined arcuate section.

4,106,893
SINTERING FURNACE

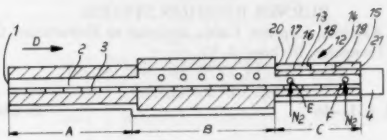
Helmut Baumann, and Fritz Petzi, Nüremberg, both of Fed. Rep. of Germany, assignors to Ludwig Riedhammer GmbH & Co. K.G., Nüremberg, Fed. Rep. of Germany

Filed Feb. 24, 1977, Ser. No. 771,444

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1976, 2658489

Int. Cl.² F27D *15/02;* **F27B** *9/26*

U.S. Cl. 432—77 **1 Claim**



1. A sintering furnace for sintering magnetic-ceramic articles comprising:

a rapid-firing carriage furnace structure having a gastight flooring;

an inlet at one end and an outlet at the other end of the structure;

means defining a plural-section cooling zone in the interior of the structure;

cooling means for effecting indirect cooling of the cooling zone with additional cooling in the section of highest temperature;

rails extending longitudinally of the structure along a lower part thereof;

carriages mounted for sliding movement along the rails;

means for selectively charging different ones of the sections of the plurality thereof in the cooling zone with different cooling media.

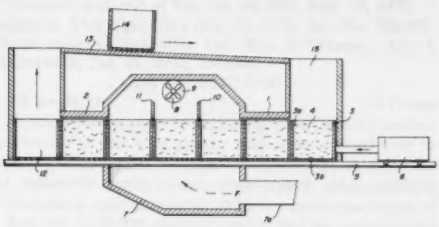
4,106,894

APPARATUS FOR HEAT TREATING FRAGMENTED MATERIALS

Andre Henri-Robert Bobleter, Villeneuve-St. Georges, and Jacques Louis-Paul Simonnet, Chevreuse, both of France, assignors to Bertin & Cie, Plaisir and Affimet, Paris, both of, FRX

Filed Dec. 15, 1976, Ser. No. 750,807
Claims priority, application France, Dec. 19, 1975, 75 38970
Int. Cl.[2] F27B *9/14*
U.S. Cl. 432—122 **6 Claims**

1. A furnace system for the heat treatment of fragmented materials, comprising, an elongated heating tunnel having smooth sides, a bottom flue in communication with said tunnel for the introduction of hot gases thereto and a top flue for collection and exhaustion of cooled gases, a basket inlet chamber having a solid ceiling at one end of said tunnel, a basket outlet chamber having a solid ceiling at the other end of said tunnel, rail means extending through the length of said tunnel, a plurality of baskets mounted on said rail means for carrying the materials to be treated through the tunnel, said baskets having solid vertical sides and a gas permeable base, an metallic slide block on the bottom of each basket in contact with the



rail means and serving as a gas seal, and means for moving said baskets through said tunnel.

4,106,895

DYE TRANSFERRING METHOD

Geoffrey Allan Smith, Melrose, and Alan James Laidlaw, Galashiels, both of Scotland, assignors to Fastran AG, Zug, Switzerland

Filed Mar. 16, 1976, Ser. No. 667,319
Int. Cl.[2] D06P *3/16, 3/06*
U.S. Cl. 8—2.5 A 3 Claims

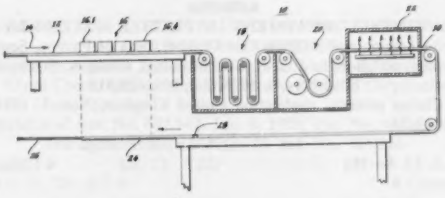
1. A method of transferring dyes which comprises transferring coloured dyes from a paper roll onto a textile fabric or material of animal fibres which has been padded with a composition selected from the group consisting of potassium hydrogen sulfate and mixture of potassium hydrogen sulphate and citric acid in the ratio of 3:2 to 2:3 and a printing paste thickener which is stable under acid conditions, using a heated press at a temperature between 80° and 120° C at a pressure of up to 10 lbs. per square inch, and for a period not exceeding 10 minutes, the printed fabric or material being then removed from the press washed in water and dried.

4,106,896

METHOD FOR PRODUCING MULTICOLOR PRINTED WEB MATERIAL

Alan Hedley Norris, and Phillip Wayne Chambley, both of Rome, Ga., assignors to Champion International Corporation, Stamford, Conn.

Filed Feb. 7, 1977, Ser. No. 766,214
Int. Cl.[2] D06P *5/12, 5/22*
U.S. Cl. 8—62 10 Claims



1. A method for producing a multicolor printed web material with dyes which are applied in separate patterns at dye printing stations on a common production web comprising the steps of

attaching a lead web segment which is non-receptive to the dyes and of sufficient length to receive the respective printing patterns to the production web;

advancing the lead web segment followed by the attached production web past the dye printing stations to print said dye patterns thereon;

adjusting the printing operation at the dye printing stations to establish proper printing patterns on the lead web segment;

processing the dye printed lead web segment and the attached printed production web to fix the dyes on the production web;

said processing step including the step of washing of the lead web segment and the production web to remove non-fixed dyes therefrom and produce a reusable lead web segment from which the dye patterns have been effectively removed.

4,106,897

LEATHER TANNING WITH OLIGOURETHANES

Harro Träubel, Leverkusen, Fed. Rep. of Germany; Helmut Reiff, New Martinsville, W. Va., and Dieter Dieterich, Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 561,809, Mar. 25, 1975, abandoned. This application Aug. 30, 1976, Ser. No. 718,489
Claims priority, application Fed. Rep. of Germany, Apr. 4, 1974, 2416485; Jan. 31, 1975, 2504081
Int. Cl.[2] C14C *0/00*
U.S. Cl. 8—94.33 15 Claims

1. Process for tanning or retanning hide, skin or leather, characterized in that hide, skin or leather are treated with an aqueous solution which contains:

(a) optionally methylolated water-soluble oligourethanes containing ionic groups which have a molecular weight of from 300 to 20,000, characterized in that the water-soluble oligourethanes contain no phenolic groups, no free NCO groups and no aziridine groups; and, optionally,

(b) formaldehyde or a substance from which formaldehyde may be split off.

4,106,898

LEATHER TANNING WITH OLIGOURETHANES

Harro Traubel, Leverkusen, Fed. Rep. of Germany; Helmut Reiff, New Martinsville, W. Va., and Dieter Dieterich, Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 561,809, Mar. 25, 1975, abandoned. This application Aug. 30, 1976, Ser. No. 718,499
Claims priority, application Fed. Rep. of Germany, Apr. 4, 1974, 2416485; Jan. 31, 1975, 2504081
Int. Cl.[2] C14C *3/18*
U.S. Cl. 8—94.33 16 Claims

1. Process for tanning or retanning hide, skin or leather, characterized in that hide, skin or leather are treated with an aqueous liquor which contains:

(a) optionally methylolated hydrophilic oligourethanes which have a molecular weight of from 300 to 20,000, characterized in that the oligourethanes have no free NCO groups, no aziridine groups, no phenolic groups, and no ionic groups; and, optionally,

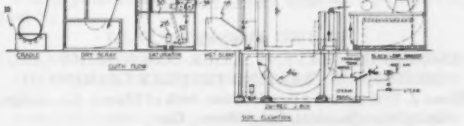
(b) formaldehyde or a substance from which formaldehyde may be split off.

4,106,899

TEXTILE GOODS BLEACHING MEANS AND METHOD

Donald G. Bousquet, Gastonia; Jesse G. Camp, Jr.; Mortimer Gilbert Hopkins, both of Charlotte, and Leonard J. Jagt, Belmont, all of N.C., assignors to Gaston County Dyeing Machine Company, Stanley, N.C.

Filed Jan. 19, 1977, Ser. No. 760,729
Int. Cl.[2] D06L *3/14*
U.S. Cl. 8—101 2 Claims



2. The method of bleaching textile goods in which the goods are first saturated with a bleaching liquor and then fed to a

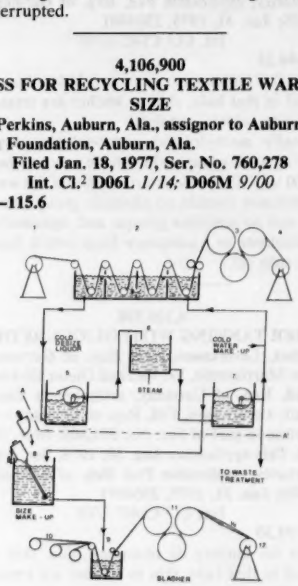
J-box for preliminary steaming and subsequent further treatment with bleaching liquor in the heel of the J-box, which comprises steaming the saturated goods within the J-box prior to piling of the goods therein, maintaining a flow of heated bleaching liquor through the goods in the heel of the J-box, and stopping the steaming and redirecting the flow of bleaching liquor to the steaming point for unheated flow throughout the J-box pile of goods whenever the feed of goods through the J-box is interrupted.

4,106,900

PROCESS FOR RECYCLING TEXTILE WARP YARN SIZE

Warren S. Perkins, Auburn, Ala., assignor to Auburn University Research Foundation, Auburn, Ala.

Filed Jan. 18, 1977, Ser. No. 760,278
Int. Cl.[2] D06L *1/14*; D06M *9/00*
U.S. Cl. 8—115.6 **6 Claims**



1. A process for sizing and desizing textile yarns which comprise the steps of
(a) dissolving a chemical which is soluble in water at one temperature and insoluble in water at a different temperature, the chemical being capable of forming a warp size in water to make an effective sizing solution;
(b) sizing textile yarns with the solution;
(c) weaving the sized yarns into a fabric;
(d) desizing the fabric by contacting the fabric with water at a temperature which will dissolve out the chemical, thereby making a desize liquor;
(e) changing the temperature of the desize liquor to precipitate a dispersion of the chemical;
(f) separating the dispersion of precipitated chemical from supernatant water;
(g) changing the temperature of the dispersion to make a solution of the chemical, and
(h) adjusting solids content of the solution as required to make a sizing solution.

2. The process of claim **1** in which the chemical used is an hydroxypropylated polysaccharide characterized by
a hydroxypropyl content of from 20% to 85% by weight of the hydroxypropylated polysaccharide, and
an average molecular weight of from 20,000 to 1,500,000.

4,106,901

EMULSIFIER-SOLVENT SCOUR COMPOSITION AND METHOD OF TREATING TEXTILES THEREWITH

Bruce J. Bishop, and Allen J. Moon, both of Macon, Ga., assignors to Star Chemical, Inc., Macon, Ga.

Filed Aug. 31, 1976, Ser. No. 719,153
Int. Cl.[2] D01C *1/00, 3/00*
U.S. Cl. 8—139 **4 Claims**

1. A method of desizing and scouring cellulosic fiber materials prior to dyeing which comprises treating said fibers with an aqueous caustic solution containing from 0.05 to 10.0% on weight fabric of a scour composition which is stable in aqueous solutions containing at least 3% caustic at ambient temperatures and up to about 212° F, comprising from about 50 to 90% by weight of a solvent medium of at least one inert organic solvent to provide a solvent medium having an average kauributanol value of at least 45 and containing by weight about:
(a) 5 to 35% of at least one phosphate ester of a 30 to 75% ethoxylated and/or propoxylated C_8–C_{24} aliphatic or aromatic alcohol;
(b) 1 to 10% of at least one C_8–C_{24} carboxylic acid or salt thereof; and
(c) 4 to 20% of either
(i) at least one member from the group consisting of a sulfonated C_8–C_{24} fatty acid or salt thereof, a 30–75% ethoxylated and/or propoxylated ester of a C_8–C_{24} carboxylic acid, a 30–75% ethoxylated and/or propoxylated glyceride of a C_8–C_{24} hydroxy containing carboxylic acid, and a sulfonated C_1–C_{18} alkyl diphenyl oxide or salt thereof; or
(ii) at least one of a 30–75% ethoxylated and/or propoxylated C_8–C_{24} aliphatic or aromatic alcohol, primary or secondary amine or mercaptan; sulfonated C_1–C_{18} alkyl benzene or salt thereof; and a C_8–C_{24} fatty diethanol amide.

4,106,902

AMMONIA TREATMENT OF TEXTILE MATERIALS

John Aitken, and William Eric Graham, both of Paisley, Scotland, assignors to J. & P. Coats Limited, Glasgow, Scotland

Filed Nov. 3, 1975, Ser. No. 628,319
Claims priority, application United Kingdom, Nov. 7, 1974, 48129/74
Int. Cl.[2] D06M *1/08*
U.S. Cl. 8—181 **4 Claims**

1. A process of treating textile material of a cellulosic nature with liquid ammonia including the step of first applying water to the textile material which is to be subsequently impregnated with liquid ammonia so that the mositure content of the material before impregnation with liquid ammonia is greater than the mositure content normally present in the prevailing conditions of atmospheric humidity but with a maximum value of 30% by weight of the dry material and then impregnating the water-containing textile material with liquid ammonia.

4,106,903
PROCESS FOR THE TREATMENT OF CELLULOSE-FIBRES

Klaus Langheinrich, Schildgen; Otto Berenstecher, Bensberg-Refrath, and Horst Renziehausen, Monheim, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

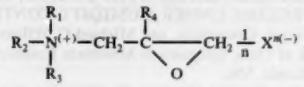
Filed Jun. 23, 1976, Ser. No. 698,958

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1975, 2527962

Int. Cl.² D06M *13/46*

U.S. Cl. 8—196 **5 Claims**

1. Process for the treatment of cellulose fibres with fixing agents before the manufacture of yarn, characterised in that cellulose fibres or their mixtures with synthetic fibres, in the form of a doubled pre-drawn sliver, are impregnated with fixing agents of the general formula



in which

R_1, R_2, and R_3 represent a C_1-C_4-alkyl group, or a hydroxyl-substituted C_2-C_4-alkyl group or

R_1 and R_2 can be joined to form a ring with N,

R_4 represents hydrogen or a methyl group,

$X^{n(-)}$ represents an anion and

n represents 1, 2 or 3,

and with an adhesive selected from the group consisting of polyacrylates, copolymers thereof, polymethacrylates, copolymers thereof, polyvinylacetates, and alginates, and the impregnated fibres are subsequently fixed.

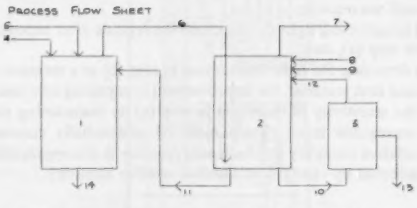
4,106,904
SUBSTITUTED PYRIDINES AND DIHYDROPYRIDINES AS CORROSION INHIBITORS

Bernardus A. Oude Alink, St. Louis, and Neil E. S. Thompson, Creve Coeur, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 647,342, Jan. 8, 1976, Pat. No. 4,022,785. This application Dec. 30, 1976, Ser. No. 755,534

Int. Cl.² C23F *11/14, 11/12*

U.S. Cl. 21—2.7 R **6 Claims**



1. A process of inhibiting corrosion of metals in aqueous systems containing corrosive substances which comprises adding to said system 0.25 to 7500 p.p.m. of a mixture of an alkylpyridine and an N-substituted alkyl 1,2-dihydropyridine prepared by reacting a hexahydrotriazine in the presence of a Lewis acid at a temperature between 80° C. and 300° C. for a period of about 0.5 to 24 hours.

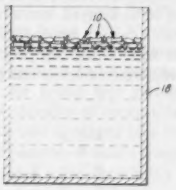
4,106,905
PROCESS FOR PROVIDING INSULATING COVERS

Joseph J. Schmitt; Richard R. Dahlen, both of White Bear Lake, and David A. Lindblad, St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Aug. 9, 1976, Ser. No. 712,681

Int. Cl.² B01J *1/18;* F28F *13/00*

U.S. Cl. 21—60.5 R **6 Claims**



1. A process for providing a thermal insulating cover of discrete, hollow, pillow shaped particles over a body of fluid comprising the steps of:

(1) forming a plurality of discrete, hollow interior ceramic particles having a diameter at their substantially circular midpoint of about 5/16 inch and a length ranging from 1.5 to 2 inches;

(2) firing said particles to a temperature of at least 350° C., the average particle density being in the range of 0.2 to 0.9 grams/cc.; and

(3) placing said particles on said fluid to form a layer at least ⅛ in. thick on top of said fluid.

4,106,906
METHOD FOR SUPPRESSING WATER EVAPORATION USING A POLYBUTADIENE FILM

Kenneth L. Moore, China Lake, and Russell Reed, Jr., Ridgecrest, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 31, 1977, Ser. No. 764,135

Int. Cl.² B01J *1/18;* E02B *1/00, 3/00*

U.S. Cl. 21—60.5 A **4 Claims**

1. A method for suppressing evaporation from a body of water which has a surface exposed to an ambient atmosphere consisting of the steps of:

(a) applying a solution consisting essentially of polybutadiene prepolymer to said surface of said body of water; and

(b) cross-linking, by air-activated cross-linking under ambient conditions, said prepolymer to form an evaporation suppressing continuous polymer film on said surface of said body of water.

4,106,907
CENTRIFUGE TUBE AND METHOD FOR PERFORMING ASSAY WITH SAME

John Cecil Charlton; John Stuart Glover, and Bryan Peter Shepherd, all of Amersham, England, assignors to The Radiochemical Centre Limited, Amersham, England

Filed Feb. 3, 1977, Ser. No. 765,403

Claims priority, application United Kingdom, Feb. 13, 1976, 5848/76

Int. Cl.² G01N *33/16;* G01T *1/16*

U.S. Cl. 23—230.3 **15 Claims**

1. A container for radioactive counting, said container comprising:

a tube of organic plastics materials having a generally cylindrical cross-sectioned reaction zone at the top portion thereof, an open top end, and a closed tapered lower end portion tapered from said top portion;

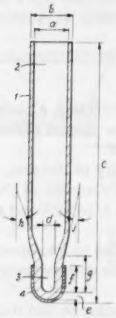
a radiation shield permanently positioned at the lower end of

said tube and extending up the side of said tube to a uniform height; and

said reaction zone having a volume of 1–10ml, and 1–10% of said reaction zone being surrounded by said shield.

14. A method of assaying a compound comprising the steps of:

introducing a sample containing said compound to be assayed together with a standard amount of a radioactivity labelled version of said compound and a standard amount, insufficient for complete reaction, of a specific reagent for said compound to be assayed into a tube-like container of plastics materials having a generally cylindrical cross-sectioned reaction zone at the top portion thereof, an open end, and a closed, tapered lower end portion tapered from



said top portion, said container further having a radiation shield permanently positioned at the lower end thereof and extending up the side of said tube to a uniform height and said reaction zone having a volume of 1–10ml with 1–10% of said reaction zone being surrounded by said shield;

causing said two compounds to compete for reaction with said specific reagent;

removing from the liquid phase the fraction of the compound which is bound to the specific reagent so that the fraction removed from the liquid phase is contained within said shielded portion of said container, and

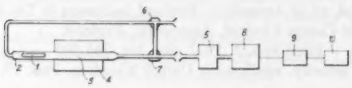
introducing said container into a counter and determining the radioactivity of that portion of the contents that is not shielded by said shield.

4,106,908

METHOD FOR THE DETERMINATION OF THE ORGANIC CARBON CONTENT IN MINERAL-CONTAINING MATERIALS

Paul A. Leplat-Gryspeerdt, Louvain, Belgium, assignor to Labofina S.A., Brussels, Belgium

Filed Apr. 12, 1977, Ser. No. 786,851
Int. Cl.[2] G01N *31/08, 31/12, 33/24*
U.S. Cl. 23—230 PC **6 Claims**



1. A method for determining the organic carbon content of raw mineral materials, which essentially consists of the steps of:

(a) determining the relationship between the percent per weight amount of organic carbon content of raw mineral materials and the relative amount of benzene present in the pyrolysis gases which are formed upon pyrolysis of samples of raw mineral materials of known organic carbon content at a pyrolysis temperature of between about 400° and about 1,000° C under an inert gas atmosphere;

(b) pyrolyzing a weighed sample of a crushed raw mineral material of unknown organic carbon content under an inert gas atmosphere at the same temperature as that which is used in the determining step (a), whereby pyrolysis gases are formed;

(c) determining the relative amount of benzene which is present in the pyrolysis gases; and,

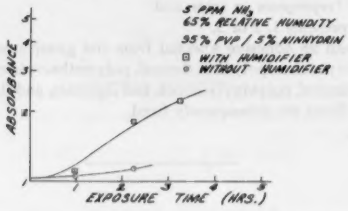
(d) determining the percent per weight amount of organic carbon content in the crushed raw mineral material which is equivalent to said amount of benzene determined in step (c) from the relationship which has been determined in step (a).

4,106,909

CHEMICAL ANALYSIS WITH COATED, LIGHT WAVEGUIDE UNDER HUMIDITY CONTROL

Donald J. David, Centerville, and Michael C. Willson, Waynesville, both of Ohio, assignors to Monsanto Research Corporation, St. Louis, Mo.

Division of Ser. No. 724,482, Sep. 20, 1976, Pat. No. 4,040,691, which is a continuation-in-part of Ser. No. 689,403, May 24, 1976, abandoned. This application Mar. 28, 1977, Ser. No. 781,596
Int. Cl.[2] G01N *21/00, 21/46*
U.S. Cl. 23—232 R **2 Claims**



1. In a method for detecting a first material wherein there are the steps of

(a) exposing an elongated waveguide having on a longitudinal peripheral surface of said waveguide a second material providing for multiple internal reflections of light through said coating material, to an unknown material which may contain said first material, said second material upon being contacted with said first material selectively combines in in a water sensitive reaction with said first material to measurably change the light transmitting capabilities of said waveguide;

(b) transmitting light through said waveguide after exposure in step (a); and,

(c) detecting the light transmitted in step (b) as a measure of said first material, the improvement comprising increasing the sensitivity of detection in step (a) by maintaining said waveguide in an environment of substantially constant relative humidity at which said reaction is not appreciably affected by changes in ambient relative humidity.

4,106,910

RAS-GAS DILUTION DEVICE

Raymond A. Saunders, Hyattsville, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

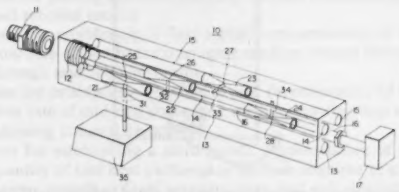
Filed Aug. 16, 1977, Ser. No. 825,351
Int. Cl.[2] G01N *1/22, 1/26*
U.S. Cl. 23—232 R **9 Claims**

4. A method of diluting a gas flow to a desired concentration containing a dilutant gas which comprises:

directing a gas flow of the diluting gas into at least two equal size passages extending along the length of a housing with

the gas flow evenly distributed into each of said passages and with the same gas flow rate,

directing the gas flow in each passage through a venturi in each of said passages wherein each venturi forms a gas diluting stage with each of said gas diluting stages placed in successive order along the length of said housing with the low pressure port of each successive stage communicating with the gas flow passage downstream of the venturi in the preceeding stage with the low pressure port of the first stage communicating with a chamber containing the gas to be diluted,



feeding a gas to be diluted at a controlled rate into the gas flowing through said first stage in said passage,

feeding the gaseous mixture in said first passage downstream of said first stage into the second stage to mix with said gas flowing through said venturi in said second passage to further dilute the gaseous flow from said first passage to said second passage, and

directing the diluted gas from the downstream passage of the second venturi into the next passage and likewise to as many passages as there are passages.

4,106,911

DEVICE FOR EXAMINING A PLURALITY OF MICRODOSES OF LIQUIDS

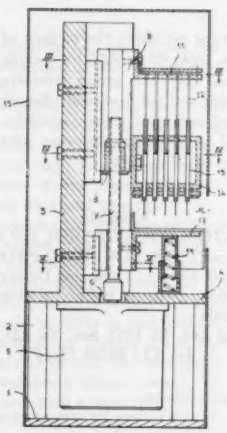
Aline Marcelli, Paris, France, assignor to Societe Francaise pour le Developpement de l'Automatisme en Biologie, Paris, France

Filed Jun. 29, 1977, Ser. No. 811,298

Claims priority, application France, Jul. 9, 1976, 76 21013; Feb. 2, 1977, 77 02846

Int. Cl.[2] G01N *1/14, 1/18*

U.S. Cl. 23—259 **7 Claims**



1. A device for examining a plurality of microdoses of liquids by means of a plurality of reagents, comprising in combination:

a frame;

a plurality of vertical syringes mounted on said frame and arranged in a fixed pattern, each of said syringes comprising a syringe body and a piston rod;

first means for imparting a relative vertical motion between the plurality of syringe bodies and the plurality of said piston rods, said first means being able to relatively move said syringe bodies and said piston rods between a near position and a remote position and vice versa as well as to a location between the near and remote positions, in order to draw up and dispense doses of liquids;

a support mounted on said frame and disposed below said plurality of vertical syringes;

second means for imparting a relative vertical motion between said plurality of syringe bodies and said support, said second means being able to relatively move said syringe bodies and said support between a near drawing up or dispensing position and a remote position;

first plate means, for filling said syringes with reagents, provided with a plurality of receptacles adapted to contain said reagents and arranged in a fixed pattern corresponding to the pattern of said syringes, said first plate means being adapted to be detachably supported by said support; and

second plate means provided with a plurality of reaction receptacles and arranged in a fixed pattern corresponding to the pattern of said syringes, said second plate means being adapted to be detachably supported by said support.

4,106,912

CARBON BLACK REACTOR WITH AXIAL FLOW BURNER

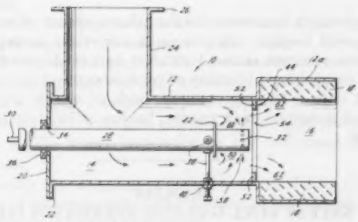
Robert E. Dollinger, Bedford; Clinton M. Wright, Odessa, both of Tex., and Theodore A. Ruble, deceased, late of Fort Worth, Tex. (by Eulalia Berry Ruble, executrix), assignors to Sid Richardson Carbon & Gasoline Co., Fort Worth, Tex.

Division of Ser. No. 711,443, Aug. 4, 1976, Pat. No. 4,077,761.

This application Oct. 31, 1977, Ser. No. 846,803

Int. Cl.[2] C01B *49/00*

U.S. Cl. 23—259.5 **4 Claims**



1. An apparatus comprising:

a carbon black reactor lined with refractory material of varying thickness defining a longitudinal tunnel of generally circular cross-sectional configuration and varying diameter,

said tunnel comprising combustion, reaction and quench zones;

a burner for supplying admixed oxidant gas and gaseous fuel to the combustion zone of said carbon black reactor for combustion therein to provide hot combustion product gases for flowing through said reactor to produce carbon black, said burner comprising,

a housing defining a generally cylindrical mixing zone having a central axis extending longitudinally therethrough,

said mixing zone being in open contiguous axial alignment with the combustion zone of said carbon black reactor,

means for introducing oxidant gas into said mixing zone to flow axially therethrough,

means for introducing gaseous fuel into said mixing zone at a point downstream of said oxidant gas introduction means, whereby said fuel is released into said flowing oxidant gas,

mixer means in said mixing zone for admixing said oxidant gas and fuel, said mixer means comprising,

a central bluff body centered about the axis of said mixing zone and extending radially outwardly from said axis, and

a peripheral bluff body disposed at the periphery of said mixing zone and extending radially inwardly toward said axis,

said central and peripheral bluff bodies being spaced axially from each other;

means for introducing liquid hydrocarbon feedstock radially into said reactor zone of said carbon black reactor; and

means for introducing quench water into said quench zone of said carbon black reactor.

4,106,913

CATALYTIC CONVERTER HAVING VIBRATION-RESISTANT CATALYST CARRIER

Tsuchio Bunda, Okazaki; Itaru Niimi, Nagoya; Yasuhisa Kaneko, and Fumiyoshi Noda, both of Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

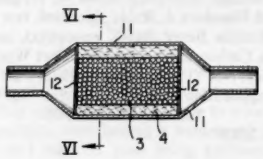
Division of Ser. No. 285,593, Sep. 1, 1972, abandoned. This application Jun. 27, 1975, Ser. No. 590,927

Claims priority, application Japan, Sep. 3, 1971, 46-67923

The portion of the term of this patent subsequent to Mar. 4, 1992, has been disclaimed.

Int. Cl.[2] **F01N** *3/15, 7/14;* **B01J** *35/04, 37/08*

U.S. Cl. 23—288 FC **9 Claims**



1. A catalytic converter for the exhaust system of an internal combustion engine, comprising: a converter casing, and a vibration resistant sintered catalyst carrier disposed in said casing comprising a plurality of ceramic catalyst carrier pieces coated with a binding material, both of which are in their sintered condition said carrier having a catalyst dispersed therein.

4,106,914

SAFETY FUEL GAS AND APPARATUS FOR GENERATING THE SAME

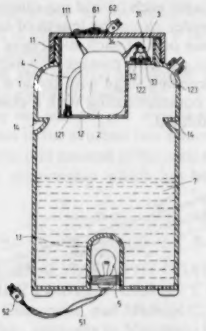
Liu Kun-Ming, No. 52, Lane 63, Lung Kang Rd., Section 1,, Chung Li, Taiwan

Filed May 9, 1977, Ser. No. 795,346

Int. Cl.[2] **C10G** *9/24*

U.S. Cl. 48—103 **1 Claim**

1. Apparatus for generating safety fuel gas comprising a container holding a fuel which is in a liquid state at normal temperature and pressure, said container is made of a light transmissible material and said container is of sufficient strength to withstand an internal pressure of at least 0.5 kg/cm^2, a sliding vane type rotary air compressor having a rotor and an electric motor coupled to drive the rotor, an inlet pipe connected to a compressed air outlet passageway of the air compressor for introducing the compressed air into the container to vaporize the liquid fuel, an outlet port provided on the container permitting the vaporized liquid fuel to leave the container and a pressure detector responsive to the pressure within the container to control the motor, the detector including a flexible disc member positioned to respond to the pressure, a switch controlling the energization of the motor and a projection provided on the flexible disc member for coupling movement of the flexible disc member to the switch whereby the pressure detector switches the motor to maintain the pressure in the container substantially constant wherein the bottom of the container defines a recess and an electric light bulb is housed in said recess to provide a visual indication of fuel level and to provide heat to facilitate vaporization of fuel in said container.



4,106,915

ABRADER FOR MIRROR POLISHING OF GLASS

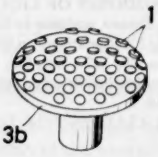
Fumio Kagawa, and Norimichi Aoki, both of Shiojiri, Japan, assignors to Showa Denko K. K., Tokyo, Japan

Filed Nov. 8, 1976, Ser. No. 739,950

Claims priority, application Japan, Nov. 11, 1975, 50-134733; Nov. 11, 1975, 50-134734; Nov. 11, 1975, 50-134735

Int. Cl.[2] **B24D** *3/32*

U.S. Cl. 51—296 **3 Claims**



1. An abrader for polishing the surface of a glass mirror, which comprises: from 40 to 90% by weight of a particulate abradant selected from the group consisting of zirconium oxide, cerium oxide and red iron oxide dispersed throughout a cured unsaturated polyester resin containing pores of a size ranging from 0.1 to 50 μm in diameter, said polyester resin having a porosity of 20 to 70%.

4,106,916

AUTOMATIC CONTROL OF AN ABSORPTION/STRIPPING PROCESS

William F. Tuckett; Gary L. Funk, and Dexter E. Smith, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 10, 1977, Ser. No. 823,368

Int. Cl.[2] **B01D** *53/14*

U.S. Cl. 55—21 **23 Claims**

1. Apparatus comprising:

an absorption column means for removing an impurity from a desired product material;

means for passing a feed stream containing said desired product material and said impurity into said absorption column means;

means for passing a stream of lean absorption medium, suitable for removing said impurity from said feed stream, into said absorption column means;

means for removing a purified desired product material from

an upper portion of said absorption column means as an absorber overhead product;

means for removing the rich absorption medium containing the absorbed impurity from a bottom portion of said absorption column means;

stripping column means and associated reboiler means for purifying said rich absorption medium by stripping at least a portion of said absorbed impurity from said rich absorption medium to produce lean absorption medium;

means for passing said rich absorption medium into said stripping column means and associated reboiler means;

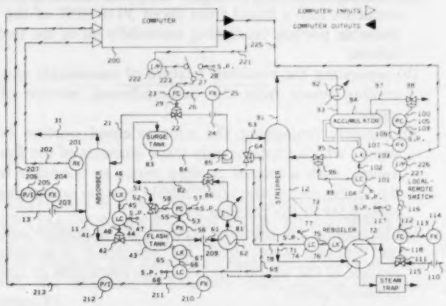
means for passing a heat exchanging medium stream through said reboiler means;

means for establishing a first signal, representative of the flow rate of said heat exchanging medium stream flowing through said reboiler means;

means for establishing a second signal, representative of the flow rate of said rich absorption medium flowing into said stripping column means;

means for establishing a third signal, representative of the quantity of said heat exchanging medium required to strip a given quantity of said impurity from said rich absorption medium;

means for producing, in response to said second and third signals, a fourth signal, representative of the required flow rate of said heat exchanging medium necessary to assure that a sufficient quantity of said impurity is removed from said rich absorption medium by said stripping column means;



means for comparing said first signal and said fourth signal and for producing a fifth signal representative of this comparison;

means for manipulating the flow rate of said heat exchanging medium to said reboiler means in response to said fifth signal, thereby regulating the stripping process;

means for removing the thus stripped impurity from an upper portion of said stripping column means as a stripping column overhead stream;

means for removing the lean absorption medium from said stripping column means and passing the removed lean absorption medium to said means for passing a stream of lean absorption medium into said absorption column means to use the thus removed lean absorption medium in absorbing said impurity in said feed stream;

means for establishing a sixth signal representative of the actual flow rate of said lean absorption medium flowing into said absorption column means;

means for establishing a seventh signal representative of the flow rate of said feed stream into said absorption column means;

means for establishing an eighth signal representative of the concentration of said impurity in said feedstream;

means for establishing a ninth signal representative of the quantity of said lean absorption medium required to absorb a given quantity of said impurity;

means for producing, in response to said seventh, eighth and ninth signals, a 10th signal, representative of the required flow rate of said lean absorption medium into said absorption column means;

means for comparing said sixth signal and said tenth signal and for producing an 11th signal representative of this comparison; and

means for manipulating the flow rate of said lean absorption medium into said absorption column means in response to said 11th signal, thereby controlling the absorption process.

14. A method of operating an absorption process and a stripping process wherein an impurity constituent of a feed material is absorbed by an absorption medium, said method comprising:

passing a feed stream containing a desired product material and an impurity into an absorption zone to therein remove the impurity from said desired product material by utilizing a suitable lean absorption medium to absorb said impurity;

removing from an upper portion of said absorption zone an absorber overhead product comprising said desired product material and having a concentration of said impurity which is less than the concentration of said impurity in said feed stream;

removing the rich absorption medium containing the absorbed impurity from a bottom portion of said absorption zone and passing said rich absorption medium into a stripping zone to therein remove said absorbed impurity from the absorption medium;

passing a heat exchanging medium stream to said stripping zone to provide reboiling heat;

measuring the flow rate of said heat exchanging medium stream and producing a first signal representative thereof;

measuring the flow rate of said rich absorption medium into said stripping zone and producing a second signal representative thereof;

establishing a third signal, representative of the quantity of said heat exchanging medium required to strip a given quantity of said impurity from said rich absorption medium;

producing, in response to said second and third signals, a fourth signal, representative of the required flow rate of said heat exchanging medium necessary to assure that a sufficient quantity of said impurity is removed from said rich absorption medium in said stripping zone;

comparing said first signal and said fourth signal and producing a fifth signal responsive to the difference therebetween;

regulating the stripping process by manipulating the flow rate of said heat exchanging medium to said stripping zone in response to said fifth signal;

removing the thus stripped impurity from an upper portion of said stripping zone as a stripping zone overhead stream;

removing the resulting lean absorption medium from said stripping zone and passing the thus removed lean absorption medium into said absorption zone to be used in absorbing said impurity in said feed stream;

measuring the actual flow rate of said lean absorption medium flowing into said absorption zone and producing a sixth signal representative thereof;

measuring the flow rate of said feed stream into said absorption zone and producing a seventh signal representative thereof;

measuring the concentration of said impurity in said feed stream and producing an eighth signal representative thereof;

establishing a ninth signal representative of the quantity of said lean absorption medium required to absorb a given quantity of said impurity;

producing, in response to said seventh, eighth and ninth signals, a 10th signal, representative of the required flow rate of said lean absorption medium into said absorption zone;

comparing said sixth signal and said 10th signal and produc-

ing an 11th signal responsive to the difference therebetween;

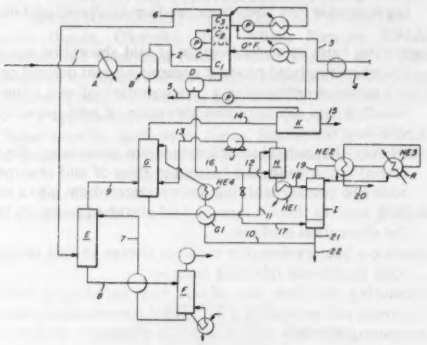
controlling the absorption process by manipulating the flow rate of said lean absorption medium into said absorption zone in response to said 11th signal.

4,106,917

GAS PREPARATION

Marvin C. Fields, Wilkins Township, Allegheny County; David L. Oliver, North Huntingdon Township, Westmoreland County, and Arthur R. Snyder, Franklin Borough, all of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Feb. 11, 1977, Ser. No. 767,916
Int. Cl.[2] B01D *53/14*
U.S. Cl. 55—31 **13 Claims**



1. Method of preparing a gas mixture for selective removal of ethylene, acetylene or mixtures thereof comprising

(a) removing water therefrom by washing the gas mixture in a lower alcohol or glycol,

(b) removing H_2S, propylene, and one or more of CS_2 and C_4 to C_{10} hydrocarbons therefrom by absorption with solvent,

(c) removing ethylene and acetylene from the contaminated solvent of step (b) by stripping it, at a temperature less than that employed in step (d), with a gas not containing ethylene or acetylene and which will not substantially dissolve in the solvent, and

(d) removing contaminants from the solvent for reuse of the solvent by stripping it, at a temperature between about −50° and about 400° F, with a gas not containing ethylene or acetylene and which will not substantially dissolve in the solvent.

8. Method of removing ethylene, acetylene, carbon monoxide, or mixtures thereof from a gas mixture comprising

(a) removing water from said gas mixture by washing it with a lower alcohol or glycol,

(b) removing H_2S, propylene, and one or more of C_2 and C_4–C_{10} hydrocarbons therefrom by absorption with solvent,

(c) removing ethylene and acetylene from the contaminated solvent of step (b) by stripping it, at a temperature less than that employed in step (d), with a gas not containing ethylene or acetylene and which will not substantially dissolve in the solvent,

(d) removing contaminants from the solvent for reuse of the solvent by stripping it at a temperature between about −50° F and about 400° F with a gas not containing ethylene or acetylene and which will not substantially dissolve in the solvent, and

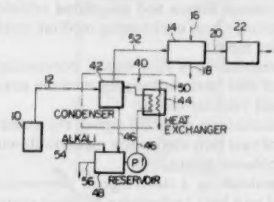
(e) contacting the gas mixture from step (b) with a cuprous aluminum halide solution to remove ethylene, acetylene or carbon monoxide therefrom.

4,106,918

METHOD OF RECOVERING FLUORINE FROM VAPOR OF CRUDE PHOSPHORIC ACID SOLUTION

Tomio Fujikawa; Masayasu Funakoshi, and Tadanori Misumi, all of Ube, Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Mar. 11, 1976, Ser. No. 665,706
Claims priority, application Japan, Mar. 14, 1975, 50-30236
Int. Cl.[2] B01D *5/00*
U.S. Cl. 55—71 **6 Claims**



1. A method of recovering fluorine values from the vapor generated by evaporation under reduced pressure of an aqueous solution of crude phosphoric acid prepared by the wet process, said vapor consisting of a condensable portion comprising the fluorine values and a noncondensable portion, comprising:

(a) directly contacting the vapor with a first cooling water to condense into a liquid from about 50 to 90% of the condensable portion containing essentially all of the fluorine values;

(b) separating the resulting mixture of condensate and first cooling water from the noncondensed portion of the vapor;

(c) directly contacting the noncondensed portion of the vapor, which contains only trace amounts of the fluorine values, with a second cooling water to condense into a liquid the rest of the condensable portion containing the remainder of the fluorine values;

(d) separating the resulting mixture of condensate and second cooling water from the remaining noncondensed portion of the vapor which consists essentially of noncondensable gases;

(e) cooling the mixture of condensate and first cooling liquid from step (b) by heat exchange with a cooling fluid in fluidic isolation from said mixture;

(f) recycling a portion of the cooled mixture from step (e) to step (a) to serve as first cooling water, while maintaining said mixture isolated from said second cooling water, so that all of said first cooling water is provided by steps (a) and (f);

(g) recovering the fluorine values from the remainder of the cooled mixture of step (f); and

(h) adjusting the pH of the cooled mixture of condensate and first cooling liquid from step (e) to about from 7 to 9.

4,106,919

ARRANGEMENT IN EMITTING ELECTRODES FOR ELECTROSTATIC PRECIPITATORS

Sebastian Lagerdahl, Norrahammar, Sweden, assignor to Aktiebolaget Svenska Flaktfabriken, Nacka, Sweden

Filed Feb. 15, 1977, Ser. No. 768,855
Claims priority, application Sweden, Feb. 27, 1976, 7602779
Int. Cl.[2] B03C *3/41*
U.S. Cl. 55—147 **5 Claims**

1. An electrostatic precipitator having collecting plates disposed in spaced parallel array, top and bottom beams with attachment means, and emitting electrodes between said plates tensionally attached by said attachment means on two sides located directly in front of each other on said beams at the top and bottom, respectively, of the electrostatic precipitator, said emitting electrodes being wound helically so that when ex-

tended and attached in the space between said collecting plates they assume a slightly wave-shaped form, said emitting electrodes comprising wire of an elastic material with high surface finish and with non-round cross-section having the length of

the long axis approximately twice the length of its short axis, and the long axis of the cross-section being directed toward the adjacent collecting plates of the electrostatic precipitator at repeating intervals along the length of the emitting electrode.

4,106,920

METHOD OF MAKING A SEMI-PERMEABLE, ESSENTIALLY WATER-INSOLUBLE, HYDROPHILIC NYLON MEMBRANE AND RESULTANT PRODUCT

Robert D. Hughes, and Edward F. Steigelmann, both of Park Forest, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 339,975, Mar. 12, 1973, Pat. No. 3,864,418. This application Aug. 14, 1974, Ser. No. 497,510

Int. Cl.[2] B01D *59/10;* **B29D** *27/04*

U.S. Cl. 55—158 **8 Claims**

1. A method of making a semi-permeable, essentially water-insoluble, hydrophilic, nylon film membrane which is essentially impermeable to liquids and wherein the membrane is suitable for separating aliphatically-unsaturated hydrocarbons of 2 to 4 carbon atoms from mixtures containing them, which comprises forming the film membrane from a solvent solution of film-forming viscosity having dissolved in a solvent hydrophilic, nylon film-forming material and citric acid pore-forming material, said pore-forming material being provided in a minor amount sufficient to increase the porosity of the nylon film when removed from the film, removing the solvent by evaporation thereby providing an essentially solid, nylon film containing citric acid pore-forming material, contacting the nylon film with an aqueous solvent for the pore-forming material, said nylon film being essentially insoluble in said solvent, to dissolve at least a portion of the pore-forming material from the nylon film sufficient to increase the porosity of the nylon film, and incorporating in the film metal containing ions which form a water-soluble complexes with said aliphatically-unsaturated hydrocarbons of 2 to 4 carbon atoms, to provide a porous, hydrophilic nylon film membrane which is essentially impermeable to liquids.

6. An essentially water-insoluble, hydrophilic semipermeable polymer film made by the process of claim 1.

4,106,921

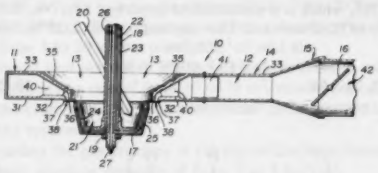
APPARATUS FOR LOW PRESSURE AIR FIBERIZATION OF MINERAL FIBER

William F. Porter, Medinah, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed Sep. 13, 1976, Ser. No. 722,467

Int. Cl.[2] C03B *37/04*

U.S. Cl. 65—14 **10 Claims**



1. In an apparatus for producing mineral fibers by forming molten slag and transforming the slag into fibers, the improvement comprising in combination:

(a) An air plenum defining a substantially toroidal air chamber and having a circular central opening, wherein said plenum is formed of a front wall, a rear wall, and a peripheral wall connecting said front wall and rear wall in spaced-apart relationship, and wherein said rear wall has a frustoconical portion surrounding said central opening converging toward said forward wall and defining a funnel for directing air toward said central opening, the radial dimension of said air chamber being greater than the axial dimension thereof, an annular opening provided in said plenum surrounding said circular opening and permitting air to be discharged from said torodial chamber through said opening in an axial direction with respect to said toroidal chamber, and a compressed air inlet,

(b) A cup mounted on a shaft adapted for rotation, the lip of said cup being positioned at said annular opening, and

(c) means for introducing molten slag into the interior of said cup when said cup rotates,

the arrangement being such that centrifugal force produced by rotation of said cup expels streams of molten slag into the air stream being discharged from said annular slot, and the air stream transforms said slag streams into mineral fibers.

4,106,922

ALKALINE DECOMPOSITION PROCESS FOR PRODUCING CALCINED PHOSPHATE FERTILIZER

Ulrich Hauschild, Hanover, and Heinrich Roetger, Gehrden, both of Fed. Rep. of Germany, assignors to Kali-Chemie, Hanover, Fed. Rep. of Germany

Filed Feb. 18, 1977, Ser. No. 770,030

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1976, 2606883

Int. Cl.[2] C05B *11/16*

U.S. Cl. 71—42 **11 Claims**

1. In an alkaline high temperature decomposition process for producing a calcined citrate-soluble alkali-containing phosphate fertilizer, which comprises the step of calcining in a rotary kiln at a temperature of between about 900° and 1300° C, a mixture comprising a raw calcium phosphate, an alkali-metal-oxide supplying compound and silicic acid in such amounts that the molar ratio between the phosphate and the alkali metal oxidesupplying compound is equivalent to a per weight ratio P_2O_5:Na_2O of between about 1:0.45 and about 1:0.7 and the amount of silicic acid is sufficient to bind an excess of calcium, the improvement, which comprises said alkali metal oxide-supplying compound, consisting essentially of the naturally occuring mineral trona.

4,106,923
PHOSPHONOMETHYL GLYCINE ESTER ANHYDRIDES, HERBICIDAL COMPOSITION CONTAINING SAME AND USE THEREOF

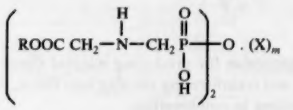
John E. Franz, Crestwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 630,392, Nov. 10, 1975, which is a continuation of Ser. No. 362,712, May 22, 1973, abandoned, which is a division of Ser. No. 170,388, Aug. 9, 1971, Pat. No. 3,799,758, which is a continuation-in-part of Ser. No. 123,057, Mar. 3, 1971, abandoned. This application Jul. 2, 1976, Ser. No. 701,766

Int. Cl.[2] A01N *9/36*

U.S. Cl. 71—86 **30 Claims**

1. A compound of the formula



wherein R is a member of the group consisting of alkyl groups containing from 1 to 12 carbon atoms, phenyl or phenoxy substituted lower alkyl groups where the alkyl group contains from 2 to 4 carbon atoms and R′— O — $C_n H_{2n}$ — groups where n is an integer of from 2 to 4 and R′ is a lower alkyl carbonyl group, X is water of hydration and m is 0 or 1.

4,106,924
PESTICIDAL COMPOSITIONS

Asbjorn Baklien, Kingsbury; Alexandru Serban, and Jocelyn Margaret Gregory, both of Croydon, all of Australia, assignors to ICI Australia Limited, Melbourne, Australia

Division of Ser. No. 551,520, May 20, 1966, abandoned. This application May 22, 1974, Ser. No. 472,308

Int. Cl.[2] A01N *9/24*

U.S. Cl. 71—106 **1 Claim**

1. The process of controlling the growth of undesired plant life which comprises treating said undesired plants with an effective amount of 2-chloro-4-nitrophenyl N-methyl carbamate.

4,106,925
NOVEL HERBICIDALLY ACTIVE, NUCLEAR-SUBSTITUTED PHENOXY-PHENOXY-ALKANECARBOXYLIC ACID DERIVATIVES AND USE THEREOF FOR CONTROLLING GRASS-LIKE WEEDS

Otto Rohr, Therwil, Switzerland; Georg Pissiotas, Lörrach, Germany, and Beat Bohner, Binningen, Switzerland, assignors to Ishihara Sangyo Kaisha Ltd., Osaka, Japan

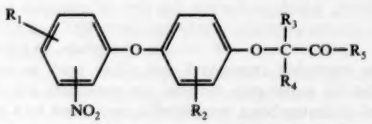
Filed Nov. 16, 1976, Ser. No. 742,311

Claims priority, application Switzerland, Nov. 20, 1975, 15033/75; Nov. 20, 1975, 15034/75

Int. Cl.[2] A01N *9/24*

U.S. Cl. 71—108 **18 Claims**

1. 4-phenoxy-α-phenoxy-alkanecarboxylic acid derivatives of the formula I



(I)

wherein

R_1 represents halogen, CF_3, lower alkyl, lower alkoxy or lower alkylthio,

R_2 represents hydrogen, halogen or lower alkyl, each of R_3 and R_4 independently repesents hydrogen or lower alkyl, and

R_5 represents C_1–C_{10} alkyloxy, C_2–C_4 alkenyloxy, C_2–C_4 alkinyloxy, C_3–C_{12} cycloalkyloxy, benzyloxy or phenoxy optionally substituted by halogen, lower alkyl or nitro.

4,106,926
SINTERED HERBICIDE-FILLED CELLULOSE ESTER PARTICLES HAVING IMPROVED RESISTANCE TO WATER LEACHING

Norman W. Thomas, Warren, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Apr. 28, 1977, Ser. No. 791,763

Int. Cl.[2] A01N *9/24, 9/20*

U.S. Cl. 71—115 **14 Claims**

1. A controlled-release sintered herbicidal composition comprising discrete particles of a water-leachable benzoic acid herbicide selected from the group consisting of mono-, di- and tri-substituted benzoic acids in which the substituents are halo, amino, nitro and lower alkoxy occupying the voids, or channels, of a particulate, substantially water-impermeable, porous cellulose ester carrier wherein said herbicide has a sintering temperature below the softening temperature of the cellulose ester carrier and said voids, or channels, communicate with the exterior surface of the cellulose ester carrier particles, the herbicidal composition being heated at about the sintering temperature of the herbicide but below the softening temperature of the cellulose ester.

4,106,927
NON-EXPLOSIVE GLYOXIME COMPOSITIONS

Harris E. Petree, Kernersville; James B. Nabors, Jr., Greensboro, both of N.C., and Henry C. Grace, Baton Rouge, La., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 27, 1976, Ser. No. 709,134

Int. Cl.[2] A01N *9/20, 9/02*

U.S. Cl. 71—121 **21 Claims**

1. A composition for facilitating the harvesting of fruit and having thermal and shock stability which comprises a blend of glyoxime and at least one water soluble ethylene glycol-based component selected from the group consisting of liquid polyethylene glycols having an average molecular weight of from about 200 to 600, and solid polyethylene glycols having an average molecular weight of from about 1000 to 7500.

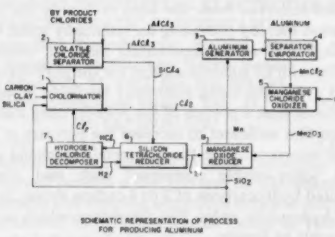
4,106,928
CHLORINATION PROCESS FOR PRODUCING ALUMINUM

Francis J. Harvey, II, Murrysville, and Maurice G. Fey, Plum Borough, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 666,812, Mar. 15, 1976, abandoned. This application Mar. 2, 1977, Ser. No. 773,457

Int. Cl.[2] C22B *21/02*

U.S. Cl. 75—68 B **7 Claims**



SCHEMATIC REPRESENTATION OF PROCESS FOR PRODUCING ALUMINUM

1. A process for the production of aluminum which is devoid

of aluminum-carbide products in a reactor comprising the steps of:

(a) chlorinating a material containing chemically combined aluminum and silicon with chlorine in the presence of carbon to yield aluminum trichloride and silicon tetrachloride,

(b) separating the aluminum trichloride from the silicon tetrachloride,

(b) separating the aluminum trichloride from the silicon tetrachloride,

(c) reacting the aluminum trichloride with manganese to yield aluminum and manganese chloride,

(d) reducing the silicon tetrachloride with hydrogen to yield elemental silicon and hydrogen chloride,

(e) oxidizing the manganese chloride to produce manganese oxide and chlorine which is recycled to step (a),

(f) reducing the manganese oxide with elemental silicon to produce manganese which is recycled to step (c), and

(g) decomposing hydrogen chloride from step (d) to produce hydrogen for recycle to step (d) and chlorine for recycle to step (a).

4,106,929

PROCESS FOR PREPARING A FERROCHROMIUM BY USING A BLAST FURNACE

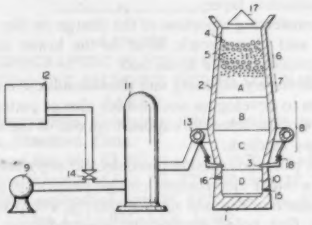
Tamekazu Saito; Mithunobu Tanaka; Yutaka Saito, and Kenich Sakaue, all of Chichibu, Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 6, 1977, Ser. No. 857,857

Claims priority, application Japan, Dec. 10, 1976, 51-148452

Int. Cl.[2] C22C *39/14*

U.S. Cl. 75—130.5 **4 Claims**



1. Process for producing ferrochromium which comprises: charging in a blast furnace (a) agglomerates containing a powder of chromium ore and a powder of carbonaceous reducing material and (b) lumpy coke, the ratio of said carbonaceous material in said agglomerates is set so that the minium value of said ratio is in agreement with the amount necessary for reducing an iron ore in the chromium ore according to the formula

$$7FeO + 10C \rightarrow Fe_7C_3 + 7CO$$

and the maximum value of said ratio is 1.2 times the amount necessary for reducing the iron oxide and chromium oxide in the chromium ore according to the formulae

$$7Cr_2O_3 + 27C \rightarrow 2Cr_7C_3 + 21CO$$

$$7FeO + 10C \rightarrow Fe_7C_3 + 7C0,$$

the slag-forming composition in the charged materials being such that the ratio of

$$\frac{CaO \text{ (by weight \%) in the slag}}{SiO_2\text{(by weight \%) in the slag}}$$

ranges from 0.4 to 1.3, and further, the ratio of

$$\frac{Al_2O_3(\%\text{ by weight}) + MgO(\%\text{ by weight})}{CaO(\%\text{ by weight}) + SiO_2(\%\text{ by weight}) + MgO(\%\text{ by weight}) + Al_2O_3(\%\text{ by weight})}$$

ranges from 0.4 to 0.8;

preheating a gas, selected from the group consisting of air and oxygen-enriched air having an oxygen content lower than 41% by volume, to a temperature from 200° to 1200° C, the airs of said gas containing a moisture content of from 3 to 50 grams per one m^3 of said air;

blowing said preheated gas through the tuyeres of said blast furnace at a rate of from 10 to 30 m^3/minute per one m^2 of the cross-sectional area of the blast furnace at the level of the tuyeres;

adjusting the gas pressure at the top of the blast furnace to a high absolute pressure of from 1 to 3 kg/cm^2;

thereby reducing said chromium ore to chromium carbide by said carbonaceous material, at a reduction degeee of more than 80% in a region of the blast furnace where the chromium ore is softened;

melting and dropping said reduced chromium carbide from said softening region to a hearth of said blast furnace; and

obtaining a ferrochromium containing more than 40% by weight of chromium and slag containing less than 5% of Cr_2O_3 from said hearth.

4,106,930

SOLDER ALLOYS FOR SOLDERING DIFFICULTLY SOLDERABLE MATERIAL

Koji Nomaki; Yoshihito Saoyama, and Ryo Tamamura, all of Yokohama, Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Division of Ser. No. 527,652, Nov. 27, 1974, abandoned, which is a continuation-in-part of Ser. No. 331,200, Feb. 9, 1973, abandoned. This application May 26, 1976, Ser. No. 690,176

Claims priority, application Japan, Feb. 19, 1972, 47-17431

Int. Cl.[2] B23K *35/12*

U.S. Cl. 75—134 B **2 Claims**

1. A solder alloy for soldering a difficultly solderable material having an oxide surface which consists essentially of 2–98 wt % Pb, 1–97.5 wt % Sn, 0.5–60 wt % Cd, 0.05–10 wt % Zn, 0.05–5 wt % Sb, 0–5 wt % Bi, and 0–15 wt % of at least one rare earth metal and which is characterized by a melting point of from 70° to 180° C.

4,106,931

METHODS FOR SINTERING POWDER METALLURGY PARTS

Harbhajan S. Nayar, Plainfield, N.J., assignor to Airco, Inc., Montvale, N.J.

Filed May 18, 1977, Ser. No. 798,052

Int. Cl.[2] B22F *3/00*

U.S. Cl. 75—201 **7 Claims**

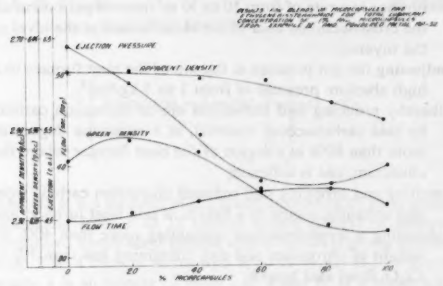
1. A process for sintering carbon steel powder metallurgy parts having a density of less than 90% theoretical maximum density and 0.3 to 1.3% carbon in the form of graphite in the hot zone of a sintering furnace comprising the steps of heating said hot zone to a temperature of at least 2000° F, passing said parts through said hot zone while supplying to said hot zone an atmosphere comprised of the following constituents by volume: at least 90% nitrogen, up to 9.75% hydrogen and carbon monoxide with said carbon monoxide comprising 5% or less of said atmosphere, 0.25–2.0% gaseous hydrocarbon and having a dewpoint of −60° F or less.

4,106,932

LUBRICANTS FOR POWDERED METALS, AND POWDERED METAL COMPOSITIONS CONTAINING SAID LUBRICANTS

John Blachford, Westmount, Canada, assignor to H. L. Blachford Limited, Montreal, Canada

Continuation-in-part of Ser. No. 600,777, Jul. 31, 1975, Pat. No. 4,002,474. This application Dec. 10, 1976, Ser. No. 749,699
Claims priority, application Canada, Jul. 31, 1974, 206086
Int. Cl.[2] B22F *1/00;* **B01J** *13/02;* **C10M** *5/14, 5/20*
U.S. Cl. 75—252 **31 Claims**



6. A novel composition of matter for the manufacture of sintered iron articles comprising a sinterable mixture comprising powdered iron and discrete pressure-rupturable microcapsules for lubrication in powder metallurgy, said microcapsules being present in an amount of 0.1% to 5%, by weight, said microcapsules comprising a core and a solid shell surrounding said core; said core comprising an organic liquid lubricant non-corrosive to ferrous metal, having a viscosity below 1500 cp and a surface tension below 50 dynes/cm and being able to wet powdered ferrous metal; said core comprising 50 to 85%, by weight, of the microcapsules; said shell being derived from the polymerization of a di- or poly-isocyanate with a di- or polyamine, non-degradable by moisture or oxygen, impermeable to said lubricant and having a smooth, non-tacky, outer surface such that the flow rate and apparent density of said mixture of powdered iron and microcapsules are at least 90% of the corresponding values for the free powdered ferrous metal, said outer surface being resistant to abrasion by powdered ferrous metal to the extent that the microcapsules can be thoroughly mixed with sinterable powdered metal without release of lubricant, said shell being rupturable when said micro-capsules are in admixture with powdered ferrous metal at a pressure of 20 to 100 t.s.i.; said lubricant and said shell being heat decomposable or volatilizable to gaseous products, which are non-corrosive to powdered ferrous metal, with a low residue of carbon at elevated temperatures below the sintering temperature of the ferrous metal; said microcapsules being spherical and having a diameter in the range of 1 to 200 microns with a shell thickness of 0.01 to 50 microns.

25. A novel composition of matter for the manufacture of a sintered metal article comprising a sinterable mixture comprising a powdered metal and microcapsules, said microcapsules being present in an amount of 0.1% to 5%, by weight, and comprising a core and a solid shell surrounding said core; said core comprising an organic liquid lubricant non-corrosive to ferrous metal, having a viscosity below 1500 cp and a surface tension below 50 dynes/cm and being able to wet powdered ferrous metal; said core comprising 50 to 85%, by weight, of the microcapsules; said shell being derived from the polymerization of a di- or poly-isocyanate with a di- or polyamine, non-degradable by moisture or oxygen, impermeable to said lubricant and having a smooth, non-tacky, outer surface such that the flow rate and apparent density of said mixture of powdered metal and microcapsules are at least 90% of the corresponding values for the free powdered ferrous metal, said outer surface being resistant to abrasion by powdered ferrous metal to the extent that the microcapsules can be thoroughly mixed with sinterable powdered metal without release of lubricant, said shell being rupturable when said micro-capsules are in admixture with powdered ferrous metal at a pressure of 20 to 100 t.s.i.; said lubricant and said shell being heat decomposable or volatilizable to gaseous products, which are non-corrosive to powdered ferrous metal, with a low residue of carbon at elevated temperatures below the sintering temperature of the ferrous metal; said microcapsules being spherical and having a diameter in the range of 1 to 200 microns with a shell thickness of 0.01 to 50 microns.

4,106,933

PIEZOELECTRIC METHOD AND MEDIUM FOR PRODUCING ELECTROSTATIC CHARGE PATTERNS

Allen L. Taylor, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Jun. 18, 1975, Ser. No. 587,904
Int. Cl.[2] G03G *15/02, 13/02*
U.S. Cl. 96—1.5 R **49 Claims**

1. A process for producing a latent electrostatic charge pattern on a surface of a copy medium that includes a layer of poled piezoelectric material with upper and lower surfaces and a layer of photoconductive material with upper and lower surfaces, with the lower surface of said piezoelectric layer juxtaposed with and electrically connected to the upper surface of said photoconductive layer, which process comprises the steps of:

(1) forming an electrostatic charge of one polarity on the upper surface of said piezoelectric layer and an electrostatic charge of opposite polarity on the lower surface of said piezolectric layer by mechanically stressing said piezoelectric layer;

(2) transferring a portion of the charge on the upper surface of said piezoelectric layer to the lower surface of said photoconductive layer; and

(3) selectively exposing said photoconductive layer to radiation to develop an electrostatic charge pattern representative of the selective exposure on one of the surfaces of the copy medium.

25. A photoconductive piezoelectric copy medium for providing a latent electrostatic charge pattern on an electrically nonconductive exposed surface thereof, comprising:

(1) a first poled electrically nonconductive piezoelectric layer that provides an electrostatic charge of one polarity on its upper surface and an electrostatic charge of opposite polarity on its lower surface when mechanically stressed;

(2) a photoconductive layer that has its upper surface juxtaposed with and electrically connected to the lower surface of said first piezoelectric layer such that a portion of the charge on the upper surface of said piezoelectric layer can be transferred to the lower surface of said photoconductive layer so that a voltage potential is developed across the photoconductive layer; and

(3) not more than one of said piezoelectric and photoconductive layers has a conductive layer juxtaposed with and electrically connected thereto such that when the photoconductive layer is selectively exposed, an electrostatic charge pattern representative of the selective exposure develops on the electrically nonconductive exposed surface of the copy medium.

4,106,934

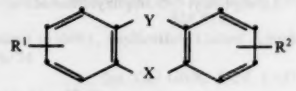
PHOTOCONDUCTIVE COMPOSITIONS AND ELEMENTS WITH CHARGE TRANSFER COMPLEXES

Ernest W. Turnblom, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

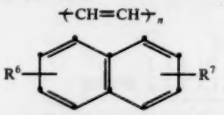
Filed Jun. 14, 1976, Ser. No. 695,350
Int. Cl.[2] G03G *5/06, 5/09*
U.S. Cl. 96—1.5 R **18 Claims**

1. A photoconductive insulating composition comprising (a) one or more p-type organic photoconductor components and

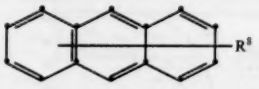
(b) a charge-transfer complex of one or more electron acceptor components and one or more electron donor components; the amount of each of said photoconductor, electron acceptor, and electron donor components being within the range of from about 10 to about 65 mole percent based on the total amount of said components present in said photoconductive composition; and the electron donor components present in said composition being selected from materials having one of the following formulas:



I.



II.



III.

wherein

n represents 0, 1, or 2; X represents oxygen, sulfur, selenium or the group $>CR^3R^4$ or $>C{=}CR^5R^6$; Y represents a single covalent chemical bond or the necessary carbon and hydrogen atoms to complete a 6 to 9 member saturated or unsaturated ring; and each of R^1 through R^8 represents a substituent group such that the resultant material forms a charge-transfer complex with 2,4,7-trinitro-9-fluorenone.

4,106,935

XEROGRAPHIC PLATE HAVING AN PHTHALOCYANINE PIGMENT INTERFACE BARRIER LAYER

Nicholas L. Petruzzella, Columbus, Ohio, assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 67,297, Aug. 26, 1970, abandoned, which is a continuation of Ser. No. 578,502, Sep. 12, 1966, abandoned. This application Apr. 24, 1975, Ser. No. 571,137

Int. Cl.[2] **G03G** *5/08, 5/082*

U.S. Cl. 96—1.5 R **8 Claims**

1. In an electrophotographic imaging member consisting essentially of a conductive substrate, an interfacial barrier layer overlying said substrate and a photoconductive insulating layer comprising selenium overlying said barrier layer, said photoconductive insulating layer having a film thickness in the range of from about 5 to about 50 microns, the improvement comprising:

an interfacial barrier layer having a thickness from about 0.5 up to about 5 microns and containing phthalocyanine pigment dispersed in an insulating binder resin, the weight ratio of pigment to resin being in the range of from about 2:1 to about 1:15.

4,106,936

MICROIMAGING FILM CONTAINING AN ORGANIC DISELENIDE, A TERTIARY PHOSPHINE OR PHOSPHITE AND AN AZO ORGANIC PEROXIDE AND THE USE THEREOF

Dana G. Marsh, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 4, 1977, Ser. No. 784,109

Int. Cl.[2] **G03C** *5/04, 5/24, 1/00*

U.S. Cl. 96—27 R **26 Claims**

1. A microimaging method which comprises:

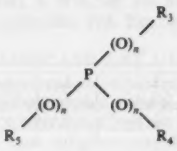
(a) providing a film of an organic polymer as matrix material having uniformly dispersed therein:

i. a photochemically reactive organo diselenide characterized by the formula:

$$R_1—Se—Se—R_2$$

wherein R_1 and R_2 are aralkyl or alkyl hydrocarbon moieties;

ii. a tertiary phosphine or phosphite characterized by the formula:



wherein each *n* is 0 in the case of a phosphine and 1 in the case of a phosphite and R_3, R_4 and R_5 are independently substituted or unsubstituted aryl hydrocarbon moieties; and

iii. an azo organic peroxide characterized by the formula:

$$R_6—N=N—R_7$$

wherein R_7 is a peroxycarboxylic acid ester moiety and R_6 is either a straight or branched chain alkyl group containing from 4 to 10 carbon atoms or the same as R_7;

(b) exposing the film in an imagewise manner to ultraviolet radiation to form an image therein; and

(c) heating the exposed film to a temperature of at least 75° C for a time sufficient, depending on the magnitude of the irradiation of step (b), to either fix the image or erase it and prepare the film for reimaging.

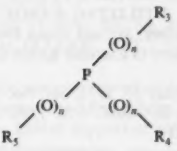
15. A microimaging film which comprises a film of an organic polymer as matrix material having uniformly dispersed therein:

i. a photochemically reactive organo diselenide characterized by the formula:

$$R_1—Se—Se—R_2$$

wherein R_1 and R_2 are aralkyl or alkyl hydrocarbon moieties;

ii. a tertiary phosphine or phosphite characterized by the formula:



wherein each *n* is 0 in the case of a phosphine and 1 in the case of a phosphite and R_3, R_4 and R_5 are independently substituted or unsubstituted aryl hydrocarbon moieties; and

iii. an azo organic peroxide characterized by the formula:

$$R_6—N=N—R_7$$

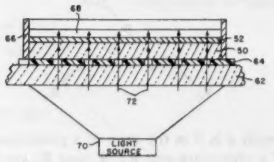
wherein R_7 is a peroxycarboxylic acid ester moiety and R_6 is either a straight or branched chain alkyl group containing from 4 to 10 carbon atoms or is the same as R_7.

4,106,937

CATHODE RAY STORAGE TUBE HAVING A TARGET DIELECTRIC PROVIDED WITH PARTICULATE SEGMENTS OF COLLECTOR ELECTRODE EXTENDING THERETHROUGH

Gerald E. McTeague, Portland, and Kenneth R. Stinger, Hillsboro, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Division of Ser. No. 645,961, Jan. 2, 1976, abandoned, which is a division of Ser. No. 356,029, Apr. 30, 1973, Pat. No. 3,956,662.
This application Aug. 13, 1976, Ser. No. 714,439
Int. Cl.[2] G03F *1/00;* **B05D** *5/12, 3/06*
U.S. Cl. 96—36.1 **3 Claims**



1. A method of fabricating a storage target for use in conjunction with a cathode ray tube comprising the steps of:

applying a layer of photopolymerizable material having a dispersion of conductive particles therethroughout onto a conductive coating of a dielectric support member;

transmitting light through a pattern of openings in a photomask which activates the photopolymerizable material to polymerize same in the areas the light engages;

washing the photopolymerizable material which removes the material not polymerized and leaving in position on said conductive coating opaque segments of conductive particles;

applying a layer of photopolymerizable material having phosphor particles dispersed therein onto said conductive coating and segments of conductive particles with said segments defining an in situ photomask;

transmitting light into said photopolymerizable material through said support member with said light activating the photopolymerizable material in the areas to polymerize same except where said opaque segments are located; and

washing the photopolymerizable material which removes the material not polymerized and leaving in position layer means of phosphor.

4,106,938

VESICULAR COMPOSITION, ELEMENT AND PROCESS UTILIZING A DIOL

George Leland Fletcher, Jr., and Jonas Dedinas, both of Pittsford, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 23, 1977, Ser. No. 799,872
Int. Cl.[2] G03C *1/52, 1/00, 5/24*
U.S. Cl. 96—48 HD **14 Claims**

1. A vesicular imaging composition comprising, in admixture,

a vesiculating agent capable of releasing a gas upon imagewise exposure to activating radiation,

a water-insoluble, thermoplastic polymeric binder having a latent image stability period for said gas sufficient for vesicular imaging,

and a diol capable of generating microscopic discontinuities in the binder when said element is formed as a coating and dried by heating at a first temperature less than about 100° C for a time sufficient to render the coating nontacky, and thereafter at a second, higher temperature between about 100° and about 200° C for less than about 30 seconds.

14. A dry process for forming a photographic image, comprising the steps of

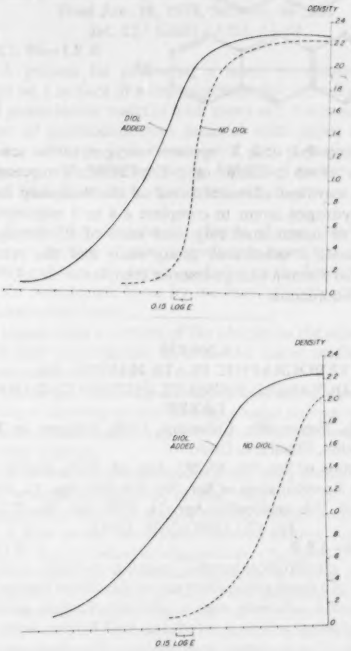
(a) imagewise exposing an element containing in admixture,

a vesiculating agent capable of releasing a gas upon imagewise exposure to activating radiation,

a water-insoluble, thermoplastic polymeric binder having a latent image stability period for said gas sufficient for vesicular imaging,

and a nucleating agent selected from the group consisting of benzopinacol; 1,2-diphenyl-1,2-dibenzylethanediol; 1,2-diphenyl-1,2-bis(2-fluorophenyl)ethanediol; 1,1,2,2-tetra-(4-chlorophenyl)ethanediol; 1,2-diphenyl-1,2-bis(4-methylphenyl)ethanediol; 1,2-diphenyl-1,2-bis-(2-naphthyl)ethanediol; 1,2-bis(2,4-dichlorophenyl)-1,2-bis(4-chlorophenyl)ethanediol; 1,2-bis(2,4-dichlorophenyl)-1,2-bis(3,4-dichlorophenyl) ethanediol; and 1,2-diphenyl-1,2-bis(4-chlorophenyl)ethanediol; and

(b) developing the exposed element by heating it at a temperature and for a time sufficient to force the gas formed by the photodecomposition of the agent to expand into vesicles which form a visible image.



4,106,939
IMAGING AND RECORDING OF INFORMATION UTILIZING A TELLURIUM TETRAHALIDE COMPLEX OF AN AROMATIC AMINE

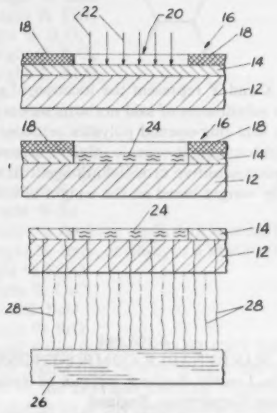
Yew C. Chang, Oakville, Canada; Stanford R. Ovshinsky, Bloomfield Hills, and David A. Strand, Novi, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Continuation-in-part of Ser. No. 596,617, Jul. 17, 1975, abandoned, which is a continuation-in-part of Ser. No. 384,089, Jul. 30, 1973, abandoned. This application Oct. 3, 1977, Ser. No. 838,574

Claims priority, application United Kingdom, Jul. 17, 1974, 31676/74

Int. Cl.[2] G03C *5/24, 1/00*

U.S. Cl. 96—48 R **28 Claims**



1. A method for producing a record of retrievable information comprising:

providing a layer including an imaging organo-tellurium material and a separate spectral sensitizer, said imaging material and said sensitizer being carried in a polymeric matrix material comprising said layer, said imaging material being in the form of a tellurium tetrahalide adduct of an aromatic amine in which nitrogen attached directly or indirectly to the aromatic radical is substituted by alkyls each containing from 1 to 4 carbon atoms and being free from diazo groups, said imaging organo-tellurium material being of one structure and having one detectable characteristic which is capable of undergoing a change in response to the application of imaging energy to produce a material of different structure having another detectable characteristic,

the step of applying imaging energy in the form of particle or wave radiation to certain portions of said layer to bring about in said certain portions of said layer the formation of a latent image, at which said imaging organo-tellurium material can be changed to said different structure having said other detectable characteristic.

20. An article for producing a record of retrievable information in the form of a dry-to-the-touch layer comprising an imaging layer including a normally solid polymeric matrix containing an imaging material and a separate spectral sensitizer for the imaging material, said spectral sensitizer being capable of absorbing photons from particle or wave radiation whereby to form a latent image, said imaging material comprising an imaging organo-tellurium material in the form of a tellurium tetrahalide adduct of an aromatic amine in which nitrogen attached directly or indirectly to the aromatic radical is substituted by alkyls each containing from 1 to 4 carbon atoms and being free from diazo groups and being of one structure and having one detectable characteristic and which is capable of undergoing a change in response to the application of imaging energy in the form of particle or wave radiation to produce at the latent image a material of different structure having another detectable characteristic.

4,106,940
LIGHT-SENSITIVE MATERIAL CONTAINING EMULSIFIED SUBSTANCES

Hans Langen, Bonn; Erwin Ranz, Leverkusen; Johannes Eibl, Burscheid-Kaltenberg, and Walther Wolf, Leverkusen, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

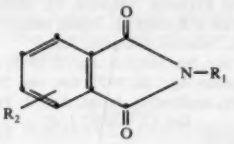
Filed Oct. 3, 1975, Ser. No. 619,229

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1974, 2447175

Int. Cl.[2] G03C *3/00, 1/52, 1/34, 1/40*

U.S. Cl. 96—74 **3 Claims**

1. Light-sensitive photographic material having at least one silver halide emulsion layer and at least one hydrophilic colloid layer containing at least one photographic additive selected from the group consisting of couplers, UV-absorbers, white toners and stabilizers emulsified in the hydrophilic layer as a mixture with at least one oil former which is substantially insoluble in water the improvement according to which the oil former is at least one compound of the formula



in which

R_1 represents a group consisting of a cycloalkyl group, a secondary alkyl group containing 3 to 8 carbon atoms, an alkoxy carbonyl substituted alkyl group containing 2 to 8 carbon atoms and an alkyl group containing 2 to 18 carbon atoms interrupted by ether oxygen and

R_2 represents hydrogen or a substituted selected halogen and hydroxyl, C_1 to C_4 alkoxy, carboxyl, C_1 to C_4 alkoxycarbonyl and phenyl groups.

4,106,941
PHOTOGRAPHIC SILVER HALIDE ELEMENTS CONTAINING OPTICAL BRIGHTENING WATER-SOLUBLE INTERPOLYMERS

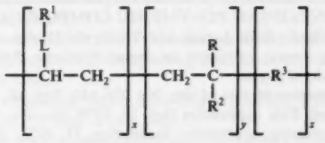
Peter W. Scullard, Webster; John Figueras, Rochester, and Carl F. Holtz, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 17, 1974, Ser. No. 489,192

Int. Cl.[2] G03C *1/92, 1/84*

U.S. Cl. 96—82 **13 Claims**

1. A photographic element containing at least one light sensitive silver halide layer and from about 0.05 grams to about 5.0 grams per square foot of support of an optical brightening interpolymer having the formula:



wherein

L is a linking group selected from the group consisting of CONH, O, COO,

S, SO_2 and

R^1 is an optical brightener moiety;
R is H or alkyl containing from 1 to 4 carbon atoms;
R^2 is an anionic solubilizing group selected from the groups consisting of COOM, SO_3M, OSO_3M, $COOR^4OSO_3M$, PO_3 and PO_4, wherein M is H or an alkali metal and R^4 is alkylene containing from 1 to 4 carbon atoms;
R^3 is a unit derived from a copolymerizable ethylenically unsaturated monomer;
x is from 0.25 to 50 mole percent, *y* is from 5 to 99 mole percent and *z* is from 0 to 90 mole percent of the interpolymer.

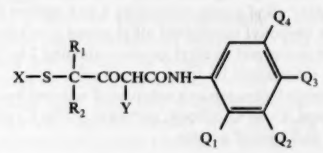
4,106,942

SILVER HALIDE EMULSION CONTAINING YELLOW COLOR COUPLERS

Mitsugu Tanaka; Kiyoshin Nakazyo, 01, Shiba; Keisuke, and Atsuaki Arai, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara, Japan

Continuation of Ser. No. 564,565, Apr. 2, 1975, abandoned. This application Apr. 26, 1977, Ser. No. 791,084
Claims priority, application Japan, Apr. 2, 1974, 49-37239
Int. Cl.[2] G03C *1/40*
U.S. Cl. 96—100 N **9 Claims**

1. A photographic silver halide emulsion containing a coupler represented by the following formula



wherein X represents an alkyl group having 1 to 20 carbon atoms; Y represents a hydrogen atom or a group capable of being released on coupling with the oxidation product of a primary aromatic amine developing agent; R_1 and R_2, which may be the same or different, each represents an alkyl group having 1 to 6 carbon atoms; Q_1 represents a halogen atom, an alkyl group, an alkoxy group, an aryloxy group or an N-substituted amino group; Q_2, Q_3 and Q_4, which may be the same or different, each represents a hydrogen atom, a halogen atom, an alkyl group, an alkoxy group, an aryl group, an aryloxy group, an alkoxycarbonyl group, a carbamoyl group, a sulfamoyl group, an alkylamino group, an arylamino group, a sulfoamino group, an acylamino group, a carboxy group, a sulfo group, a cyano group or a hydroxy group.

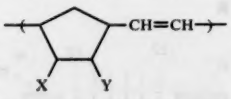
4,106,943

PHOTOSENSITIVE CROSS-LINKABLE AZIDE CONTAINING POLYMERIC COMPOSITION

Hiroharu Ikeda; Seiji Aotani, and Yoshiyuki Harita, all of Yokohama, Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 506,140, Sep. 16, 1974, abandoned. This application Oct. 13, 1976, Ser. No. 731,606
Claims priority, application Japan, Sep. 27, 1973, 48-108753
Int. Cl.[2] G03C *1/70, 1/52*
U.S. Cl. 96—115 R **5 Claims**

1. A photosensitive composition consisting essentially of (1) a ring-opened polymer or copolymer of at least one norbornene derivative selected from the group consisting of methyl 5-norbornene-2-carboxylate, dimethyl 5-norbornene-2,3-dicarboxylate, N,N-dimethyl-5-norbornene-2-carboxylic acid amide, 5-norborne-2-nitrile and 5-norbornene-2,3-dicarboxylic anhydride, or a ring-opened copolymer of at least one said norbornene derivative and at least one cyclo-olefin selected from the group consisting of cyclopentene, cyclooctene and norbornene, wherein the molar ratio of the norbornene derivative to the cycloolefin in the ring-opened copolymer is from 100 : 0 to 10 : 90, wherein said ring-opened polymer of said norbornene derivative has a structure comprising units of the general formula:



in which X and Y represent the location of said 2- and 3-position substituents of said norbornene derivative,
and wherein said ring-opened polymer or copolymer is thermoplastic and is soluble in organic solvents or water; and (2) an azide type photosensitive crosslinking agent in an amount of 0.01 to 5% by weight based on the weight of said polymer or copolymer.

4,106,944

HARDENABLE COMPOSITIONS

David Epstein, London, England, assignor to National Research Development Corporation, England

Filed Apr. 9, 1976, Ser. No. 675,274
Claims priority, application United Kingdom, Apr. 10, 1975, 14822/75
Int. Cl.[2] B28B *7/34*
U.S. Cl. 106—38.2 **4 Claims**

1. In a hardenable foundry composition that can be formed into the shape of a foundry core or mould and hardened, comprising an inert particulate refractory material selected from refractory oxides and silicates and binder ingredients that react to form a cured binder that hardens the composition, the improvement which consists of the use as binder ingredients of a particulate aluminosilicate glass and an aqueous solution of a polymer of acrylic acid that will leach cations from the glass to form the reacted binder, and in which the amount of the said binder ingredients is from 1 to 10% by weight of the composition.

4,106,945

INVESTMENT MATERIAL

Edmund E. Erndt, Timberlake, Ohio, assignor to Precision Metalsmiths, Inc., Cleveland, Ohio

Continuation of Ser. No. 689,153, May 24, 1976, abandoned. This application May 23, 1977, Ser. No. 799,523
Int. Cl.[2] B28B *7/34*
U.S. Cl. 106—38.3 **8 Claims**

1. An investment material for use in making fired refractory molds consisting essentially of a gypsum binder and a refractory which is at least 15% by weight pyrophyllite.

5. A refractory mold comprising a fired body of investment material contained within a flask and consisting, before firing, essentially of a gypsum binder and a refractory which is at least 15% by weight pyrophyllite.

4,106,946

STEEP ABSORPTION EDGE FILTER GLASS

Willi Ritze, Mainz-Mombach, Fed. Rep. of Germany, assignor to Jenaer Glaswerk Schott & Gen., Mainz, Fed. Rep. of Germany

Filed May 9, 1977, Ser. No. 795,451

Claims priority, application Fed. Rep. of Germany, May 15, 1976, 2621741

Int. Cl.[2] C03C *3/04, 3/30*

U.S. Cl. 106—52 13 Claims

1. A glass suitable for filters with steep absorption edges in the wavelength range of 455 to 850 nm, consisting essentially of:

40 – 63 weight % SiO_2
8 – 30 weight % alkali metal oxides
14 – 30 weight % ZnO
0.9 – 9 weight % TiO_2
0 – 9 weight % B_2O_3
0 – 2.5 weight % P_2O_5
0 – 1.5 weight % Al_2O_3
0 – 2 weight % F
0 – 2 weight % CdO
0 – 2.5 weight % CdTe
0 – 1.65 weight % ZnS
0 – 2.0 weight % CdS
0 – 0.9 weight % S
0 – 0.9 weight % Se
0 – 0.8 weight % As_2S_3 or As_2S_4 or a mixture thereof
0 – 0.5 weight % Sb_2S_3 or Sb_2S_5 or a mixture thereof
0 – 6 weight % MgO
0 – 15 weight % CaO
0 – 8 weight % BaO
0 – 12 weight % SrO

with the provision that the total of MgO, CaO, BaO, SrO, ZnO and CdO is not higher than 36% by weight, and that the minimum content of the colloidal coloring components, CdTe, ZnS, CdS, S and Se or of any combination thereof is 0.5% by weight.

4,106,947

BEADS OF CERAMIC MATERIAL

Joseph Recasens, Sorgues, and Andrē Penez, Courthezon, both of France, assignors to Societe Europeenne des Produits Refractaires, Neuilly-sur-Seine, France

Filed Jul. 30, 1976, Ser. No. 710,332

Claims priority, application France, Aug. 6, 1975, 75 24527

Int. Cl.[2] C04B *35/48*

U.S. Cl. 106—57 7 Claims

1. Beads of ceramic material having a diameter of between about a few tenths of a mm and about 4 mm obtained by fusion, conversion into beads and solidification of a starting batch consisting, on the oxide basis, of up to 85% by weight of ZrO_2, a proportion of SiO_2 such that the weight ratio ZrO_2/SiO_2 is greater than or equal to 1.5, an optional proportion of Al_2O_3 such that the weight ratio Al_2O_3/SiO_2 is 0 to 1.5 and an optional proportion of Na_2O such that the weight ratio Na_2O/SiO_2 is from 0 to 0.04, the starting batch also containing at least one of the additional oxides MgO and CaO in proportions such that the weight ratio MgO/SiO_2 is from 0.03 to 1 and the weight ratio CaO/SiO_2 is from 0.03 to 1.45.

4,106,948

AQUEOUS COMPOSITIONS

Bryan Ewart Cooper, and Paul Lance Millard, both of South Glamorgan, Wales, assignors to Dow Corning Limited, Barry, Wales

Filed May 25, 1977, Ser. No. 800,241

Claims priority, application United Kingdom, Jun. 8, 1976, 23558/76

Int. Cl.[2] C08L *1/28*

U.S. Cl. 106—197 R 6 Claims

1. An aqueous composition consisting essentially of the product that has been obtained by mixing together (A) water, (B) hydroxyethyl cellulose and (C) an organosilicon compound of the general formula $RSi(OR')_3$, wherein R represents an organic group selected from methyl, ethyl and vinyl groups and R′ represents an organic group selected from methyl, ethyl and methoxyethyl groups.

4,106,949

TREATMENT OF CLAY MINERAL PIGMENT

Peter James Malden, Lostwithiel, England, assignor to English Clays Lovering Pochin & Company, Limited, Austin, England

Filed Oct. 29, 1974, Ser. No. 518,970

Claims priority, application United Kingdom, Nov. 2, 1973, 51119/73

Int. Cl.[2] C09C *1/42*

U.S. Cl. 106—288 B 13 Claims

1. A process for reducing the viscosity at a given solids content of an aqueous suspension of a clay mineral for use as a pigment in a paper coating composition, which process consists essentially of the step of mixing an aqueous suspension of the clay mineral at a solids content in the range of from 5 to 30% by weight and at a pH of from 4.5 to 6.0 with from 0.05 to 0.25% by weight of a water-soluble compound having a plurality of basic groups and a number average molecular weight not greater than 1000 selected from the group consisting of polyethylene imine, ethylene diamine, 1:12 dodecane diamine, diethylene triamine, tetraethylene pentamine, and hexamethylene tetramine.

4,106,950

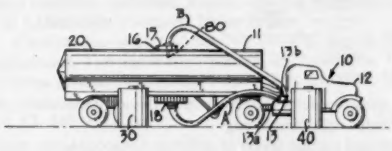
TANK WAGON CLEANING METHOD

Thomas A. Grismer, Dayton, Ohio, assignor to Economics Laboratory, Inc., St. Paul, Minn.

Filed Oct. 28, 1977, Ser. No. 846,380

Int. Cl.[2] B08B *3/02, 9/08*

U.S. Cl. 134—10 6 Claims



1. In a method for cleaning the interior of the tank of a transport tank truck with a reuseable organic solvent mixture stored in a stationary external storage means external to said tank truck, said reuseable organic solvent mixture being sprayable from a portable sprayhead means, wherein the tank truck comprises:

(a) a pump means located on said tank truck, said pump means comprising an inlet means and an outlet means;
(b) an inlet hose means having a first and a second end, at least one end adapted for being connected to said pump inlet means;
(c) an outlet hose means having a first and a second end, at least one end adapted for being connected to said pump outlet means;
(d) a tank means located on said tank truck, said tank means being capable of transporting chemicals and comprising:
(1) a tank;
(2) a manhole means including a manhole cover located near the top of said tank;
(3) a drain means located near the bottom of said tank;

said cleaning method comprising:

(a) inserting a portable sprayhead means into the interior of said tank through said manhole means;
(b) connecting one end of said outlet hose means to said

pump outlet means and connecting the second end of said outlet hose means to said sprayhead means;

(c) connecting one end of said inlet hose means to said pump inlet means and connecting the second end of said inlet hose means to said external storage means containing said reusable organic solvent mixture;

(d) pumping a residue-dissolving quantity of reusable organic solvent mixture from said external storage means into said tank;

(e) disconnecting said second inlet hose end from said external storage means and connecting said second inlet hose end to said drain means;

(f) starting said pump means and circulating said reusable organic solvent mixture through said tank, said drain means, said inlet hose means, said outlet hose means, and said sprayhead means;

(g) stopping said pump means;

(h) disconnecting said second outlet hose end from said sprayhead means and connecting said second outlet hose end to said external storage means; and

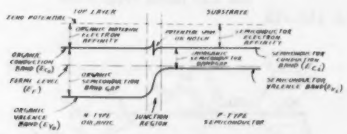
(i) pumping said reusable organic solvent mixture out of said tank and back into said external storage means so that said reusable organic solvent mixture can be reused.

4,106,951

PHOTOVOLTAIC SEMICONDUCTOR DEVICE USING AN ORGANIC MATERIAL AS AN ACTIVE LAYER

James V. Masi, Huntington, Conn., assignor to UCE, Inc., South Norwalk, Conn.

Filed Aug. 12, 1976, Ser. No. 713,880
Int. Cl.[2] H01L *31/06*
U.S. Cl. 136—89 NB **5 Claims**



1. A semiconductor heterojunction device particularly useful as a solar cell, comprising

(a) first and second layers of different semiconductor materials, said first layer comprising the radiation receiving layer to which incident radiation is applied and consisting a solid, polymeric organic semiconductor material having a resistivity of less than 10^6 ohm-centimeters and said second layer consisting of an inorganic semiconductor material,

(b) said first and second layers each having a bandgap separating a conduction energy level band from a valence energy level band and by an electron affinity separating the conduction energy level band from a level of zero potential energy,

(c) said first and second layers being disposed in contact with each other forming a semiconductor heterojunction therebetween,

(d) said first layer of semiconductor material exhibiting one type of conductivity and said second layer of semiconductor material having the same or opposite type conductivity with respect to said first layer,

(e) said first layer having an energy bandgap wider than said second layer, and

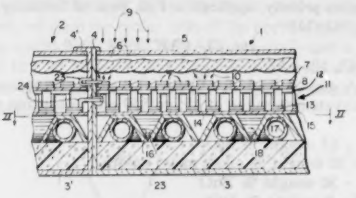
(f) electrode means positioned on said first and second layers of semiconductor materials for providing electrical connections thereto, said electrode means positioned on said first layer being permeable to the radiation applied to said first layer.

4,106,952

SOLAR PANEL UNIT

Jerome H. Kravitz, 12403 Braxfield Ct., Rockville, Md. 20952

Filed Sep. 9, 1977, Ser. No. 831,962
Int. Cl.[2] H01L *31/04*; F24J *3/02*
U.S. Cl. 136—89 HY **10 Claims**



1. A solar energy conversion system, comprising:

a top fluid impervious sheet that freely passes solar radiant energy;

a plurality of photoelectric cell means arranged in a plane spaced below and parallel to said top sheet for receiving the solar radiant energy and directly converting a portion into electricity and converting substantially the remainder into heat;

means electrically connecting said photoelectric cell means in a power producing circuit;

a thermopile means below said photoelectric cell means for receiving the heat, converting a portion of the heat into electrical energy, and transmitting the remainder of the heat downwardly;

support means between said array of photoelectric cell means and said thermopile means for electrically insullating said thermopile means from said photoelectric cell means, for conducting heat downwardly, and converting any radiant energy directly received thereon into heat;

a planar heat sink means immediately below said thermopile means for receiving and transmitting downwardly the heat transmitted by said thermopile means; and

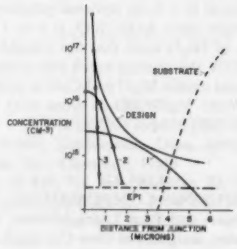
liquid conduit means beneath and in heat exchange relationship with said heat sink means.

4,106,953

METHOD OF PRODUCING AN ION IMPLANTED TUNING DIODE

George C. Onodera, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 28, 1976, Ser. No. 754,924
Int. Cl.[2] H01L *21/265, 29/93*
U.S. Cl. 148—1.5 **7 Claims**



1. A method for producing a semiconductor device having a predetermined capacitance-voltage characteristic resulting from a particular doping distribution comprising the steps of:

a. providing a semiconductor body having a high resistivity epitaxial layer of a first conductivity type on a low resistivity wafer of the same conductivity type;

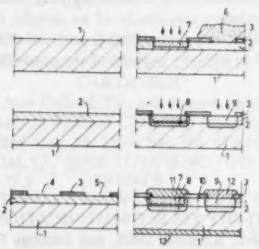
b. oxidizing the surfaces of said semiconductor body to provide an oxide layer thereon;
c. selectively removing said oxide layer from said semiconductor body to define an opening on said epitaxial layer;
d. implanting first ions through said opening and into said epitaxial layer;
e. thermally redistributing said first implanted ions;
f. implanting second ions through said opening and into said epitaxial layer;
g. thermally redistributing said first and said second implanted ions;
h. implanting third ions through said opening and into said epitaxial layer;
i. thermally redistributing said first, said second, and said third implanted ions; and
j. forming a PN junction in said semiconductor body by diffusing a conductivity determining impurity into said ion implanted epitaxial layer.

4,106,954

METHOD OF MANUFACTURING TRANSISTORS BY MEANS OF ION IMPLANTATION

Michel de Brebisson, Caen, and Maurice Bonis, Herouville, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 10, 1977, Ser. No. 767,570
Claims priority, application France, Feb. 20, 1976, 76 04758
Int. Cl.[2] H01L *21/265*
U.S. Cl. 148—1.5 **10 Claims**



1. A method of manufacturing a semiconductor device having a semiconductor body comprising at least one transistor in which an emitter zone of a first conductivity type, an underlying intrinsic base zone of a second conductivity type, and an extrinsic base zone of the second conductivity type connected to the intrinsic base zone are provided by ion implantation in a surface-adjoining region of the first conductivity type in said semiconductor body, the extrinsic base zone being provided with a connection conductor, comprising the steps of subjecting at least a part of the surface of the surface-adjoining region of the first conductivity type to a bombardment with ions of a dopant determining the second conductivity type so as to form the extrinsic base zone, covering the implanted surface with a layer masking against ion implantation, providing a first and a second window in said layer, implanting ions of a dopant determining the first conductivity type and ions of a dopant determining the second conductivity type through the first window so as to form the emitter zone and the intrinsic base zone, said ions forming the intrinsic base zone being implanted to a depth sufficient to convert a portion of said surface-adjoining region of the first conductivity type to the second conductivity type of said intrinsic base zone, contacting the emitter zone via the first window and contacting the extrinsic base zone via the second window.

4,106,955

COATING STEEL SURFACES

Carl Horowitz, Brooklyn; Duryodham Mangaraj, Staten Island, and Joseph A. Iorio, Ozone Park, all of N.Y., assignors to Gulf & Western Manufacturing Company, New York, N.Y.

Filed Feb. 5, 1975, Ser. No. 547,427
Int. Cl.[2] B05D *7/14, 3/02*
U.S. Cl. 148—6 **5 Claims**

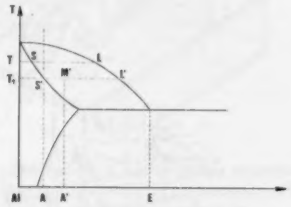
1. The process, for providing a steel workpiece with a coating of organic polymeric material, which includes the steps of:
(i) applying to an exposed face of the workpiece a composition including:
(a) a polymerisable material having at least one constituent selected from the group consisting of
glycidyl methacrylate
glycidyl acrylate
dimethyl amino ethyl acrylate
hydroxy ethyl methacrylate
hydroxy propyl methacrylate
(b) monomer having at least one active group, adapted to form graft polymerisation linkages with the steel and with the polymerisable material, selected from the group consisting of
hydroxyl
carbonyl
amine
amide
glycidyl
aziridinyl
(c) silver nitrate as a graft initiator
(ii) heating the composition until cured.

4,106,956

METHOD OF TREATING METAL ALLOYS TO WORK THEM IN THE STATE OF A LIQUID PHASE-SOLID PHASE MIXTURE WHICH RETAINS ITS SOLID FORM

Serge Bercovici, Grenoble, France, assignor to Societe de vente de l'Aluminium Pechiney, Paris, France

Continuation-in-part of Ser. No. 564,475, Apr. 2, 1975, abandoned. This application Feb. 18, 1977, Ser. No. 770,017
Claims priority, application France, Feb. 19, 1976, 76 05159
Int. Cl.[2] C22F *1/04*
U.S. Cl. 148—11.5 A **12 Claims**



1. A process for the treatment of a mass of solid aluminum alloy for making extruded products of aluminum alloy comprising the steps of:
(a) heat treating a billet of said alloy having a primary dendritic phase by subjecting it without agitation to an intermediate temperature between solidus and liquidus corresponding to a ponderable proportion of the liquid phase below about 25%;
(b) maintaining said billet at said intermediate temperature without agitation for a sufficient period of time to permit the solid dendritic phase to at least begin direct transformation into the globular form;
(c) subjecting said treated billet of aluminum alloy without agitation to extrusion while at said intermediate temperature state.

4,106,957

REINFORCEMENTS

Willy Tournoy, Lodewijk, Belgium, assignor to N. V. Bekaert S.A., Zwevegem, Belgium

Filed Aug. 29, 1972, Ser. No. 284,496

Claims priority, application United Kingdom, Sep. 2, 1971, 41043/71

Int. Cl.[2] B60C *9/02*; C21D *9/34, 9/52*

U.S. Cl. 148—12 B **12 Claims**

1. A high carbon steel cord for reinforcement of vehicle tires, characterized in that it comprises a number of wires having a substantially martensitic crystal structure of an elongation ability ranging between 3 and 10%.

4,106,958

CHLORINATED WAX FLUX COMPOSITIONS

Robert A. Stayner, Lafayette; Richard C. Fox, San Rafael, and Thornton K. Jones, Greenbrae, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Jun. 30, 1977, Ser. No. 811,503

Int. Cl.[2] B23K *35/34*

U.S. Cl. 148—23 **5 Claims**

1. A chlorinated wax-flux composition having a chlorine content below 50 weight percent and which is solid at 25° C comprising a mixture of (a) a wax having a melting point between 40° and 100° C; and (b) a solid chlorinated wax having a chlorine content greater than 60 weight percent.

4,106,959

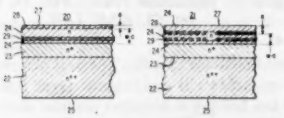
PRODUCING HIGH EFFICIENCY GALLIUM ARSENIDE IMPATT DIODES UTILIZING A GAS INJECTION SYSTEM

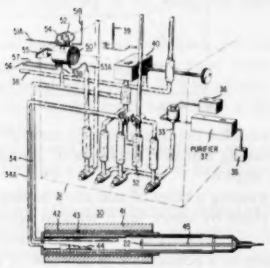
James Vincent DiLorenzo, Piscataway; William Charles Niehaus, Murray Hill, and Lawrence John Varnerin, Jr., Watchung, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 538,082, Jan. 2, 1975, Pat. No. 3,986,192. This application Jul. 6, 1976, Ser. No. 702,393

Int. Cl.[2] H01L *21/205, 29/207, 29/48*

U.S. Cl. 148—175 **6 Claims**





1. A process for making a gallium arsenide diode comprising:

a. epitaxially depositing at least one layer of gallium arsenide on the surface of a gallium arsenide substrate from materials including a source of gallium, a source of arsenic, and a conductivity-type determining impurity;

b. varying the amount of conductivity-type determining impurity during the epitaxial deposition in the following sequence:

(1) raising the amount of impurity, (2) lowering the amount of impurity, and (3) raising the amount of impurity this sequence being timed such that a relatively thin region of the layer, ranging in thickness from 100 Angstroms to 0.5 μm, is deposited while the impurity level is raised, so as to form a layer having a first relatively thin region formed during step 1 and a second relatively thin region formed during step 3 both of which regions having an impurity concentration that is relatively high with respect to the bulk of the layer,

c. forming an electrical contact to the gallium arsenide substrate; and

d. forming a rectifying barrier contact on the deposited gallium arsenide layer.

4,106,960

TEMPERATURE-COMPENSATING PROPELLANT CHARGE

Heinrich Brachert, and Johannes Eich, both of Troisdorf, Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed Jan. 27, 1977, Ser. No. 763,161

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1976, 2603927

Int. Cl.[2] C06B *45/22*

U.S. Cl. 149—11 **16 Claims**

1. A propellant composition comprising individual powder particles of a nitrocellulose containing propellant coated with a material consisting essentially of an acrylic resin having a molecular weight between 100,000 and 200,000, the coating comprising 10 to 20% by weight of the propellant.

4,106,961

METHOD OF MANUFACTURING A LONGITUDINALLY WATERTIGHT TELECOMMUNICATION CABLE

Frederik Hendrik Kreuger, Delft, and Jacobus Petrus Ignatius Van Kesteren, Leidschendam, both of Netherlands, assignors to N.K.F. Kabel B.V., Netherlands

Continuation of Ser. No. 585,959, Jun. 11, 1975, abandoned. This application Sep. 2, 1976, Ser. No. 719,925

Claims priority, application Netherlands, Jun. 28, 1974, 7408740

Int. Cl.[2] H01B *13/00*

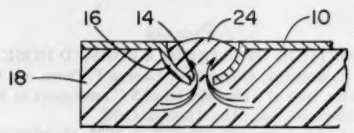
U.S. Cl. 156—48 **2 Claims**

1. A method of manufacturing a longitudinally watertight telecommunication cable, which comprises providing an initial multiplicity of longitudinally extending synthetic resin-insulated conductors, applying about said initial multiplicity of conductors in longitudinally separated regions first layers of a moisture-vulcanizable silicone rubber, positioning a second multiplicity of longitudinally extending synthetic resin-insulated conductors about said first conductor-silicone rubber combination, applying about said second multiplicity of conductors second layers of a moisture-vulcanizable silicone rubber at the same longitudinally separated regions as the first layers of moisture-vulcanizable silicone rubber, repeating said sequential steps of positioning a multiplicity of longitudinally extending synthetic resin-insulated conductors and applying layers of a moisture-vulcanizable silicone rubber until a cable core having the desired diameter is obtained, and thereafter applying a sheath about said cable core before the silicone rubber has been completely vulcanized.

4,106,962
METHOD OF FASTENING METAL PART TO PLASTIC PART

Robert Clarence Adams, St. Clairsville, and James H. Sweigart, Cambridge, both of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Jul. 14, 1977, Ser. No. 815,759
Int. Cl.[2] B29C *27/08;* B32B *31/00;* B06B *3/00*
U.S. Cl. 156—73.1 10 Claims

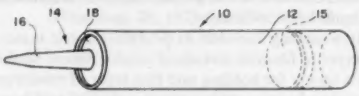


1. A method of bonding a metallic member to a non-metallic member comprising the steps of:
providing an aperture in said metallic member,
working the metallic member in the area adjacent said aperture to form a depression therearound,
placing the depression of said metallic member in contact with the surface of said non-metallic member, and
sonically heating a portion of said non-metallic member adjacent the depression to cause the material of said portion to soften and to flow through said aperture into said depression.

4,106,963
METHOD OF MAKING AN ALL PLASTIC CAULKING CARTRIDGE

Carl F. Yealy, New Oxford, Pa., and Joseph Abbott, Cincinnati, Ohio, assignors to Penland Container, Inc., Hanover, Pa.

Filed Mar. 18, 1974, Ser. No. 452,103
Int. Cl.[2] B32B *31/16;* B29C *19/00*
U.S. Cl. 156—73.5 13 Claims

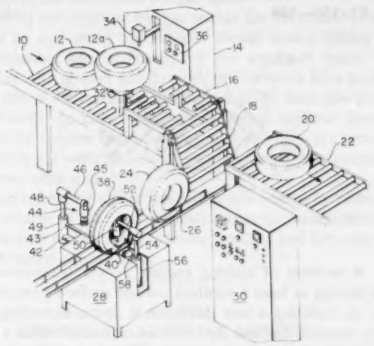


1. A method of making an all plastic caulking cartridge comprising the steps of providing a rigid thermoplastic first member comprising a generally disc shaped wall and an elongated spout extending therefrom, extruding a high density thermoplastic directly into a cylindrically shaped second member comprising a rigid cylindrical body for said cartridge, extruding a liner for said second member at the same time as said second member is being extruded, said second member having a constant inner diameter substantially throughout its length, said first member and said second member being provided with annular surface of substantially the same diameter, maintaining the cylindrical shape of said second member while rotating one of said members at a high speed relative to the other of said members and while urging said first and second members toward each other so that said annular surfaces are in contact to generate friction at the interface of said annular surfaces, maintaining the speed of said rotation sufficiently high so that the thermoplastic along said interface melts, stopping said rotation and permitting said thermoplastic to fuse along said interface.

4,106,964
BALANCE CORRECTION METHOD AND APPARATUS

Joseph M. DeVittorio, Indianapolis, Ind., assignor to Ransburg Corporation, Indianapolis, Ind.

Filed Jun. 11, 1976, Ser. No. 695,210
Int. Cl.[2] G01M *1/00*
U.S. Cl. 156—75 20 Claims

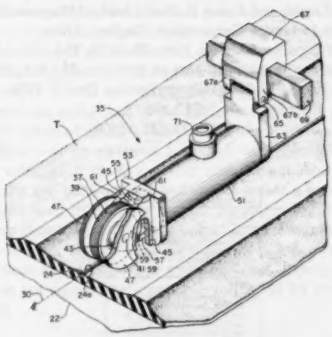


5. The method of claim 1 in which the elastomer composition is deposited in an elongated pool on the tire.

4,106,965
TIRE TREAD LINE STRIPPING

Michael Wayne Lee, Arlington, Ky., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 12, 1977, Ser. No. 832,509
Int. Cl.[2] B29H *17/02, 17/36*
U.S. Cl. 156—123 R 9 Claims

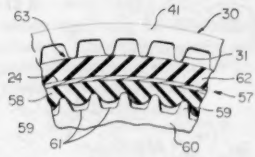


1. The method of making a tire to enable objective visual determination, after curing the tire, of the accuracy of building and molding such tire which method comprises:
while extruding uncured tread for such tire, providing thereon a visible raised and inked reference line coincident with the longitudinal centerline of said tread;
while building such tire, applying a length of said tread thereon and locating said line at the mid-circumferential plane of the tire;
inserting the tire including the tread thereon into a mold having mold parts which meet at a parting line in said plane and curing the tire, said parting line causing a line marking around the tire after curing;
then removing the tire;
whereby the relation of said parting line marking and the visible reference line provide objective indication of the accuracy of building and of molding the tire.

4,106,966
METHOD OF MAKING TOOTHED ENDLESS POWER TRANSMISSION BELTS

Alden W. Brooks, Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio

Filed May 20, 1977, Ser. No. 799,012
Int. Cl.[2] B29H *7/22*; F16G *1/00*
U.S. Cl. 156—138 13 Claims

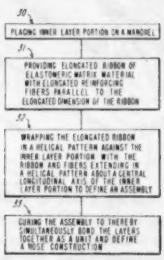


1. A method of making endless power transmission belts each having at least a toothed outside surface comprising the steps of, building a belt sleeve on a drum, extruding a polymeric material through an extrusion orifice to define a reusable cylindrical curing jacket having a toothed inside surface around said sleeve with the teeth thereof being disposed adjacent said sleeve, wherein the teeth comprising said toothed surface extend parallel to the longitudinal axis of said jacket, curing said sleeve with said jacket therearound while subjecting the jacket to pressure causing the inside teeth thereof to define corresponding outside teeth on said sleeve, removing said jacket from around said drum for reuse thereof, and cutting said sleeve to define said belts.

4,106,967
HOSE CONSTRUCTION AND METHOD OF MAKING SAME

Arthur D. Logan, and James B. Rush, both of Waynesville, N.C., assignors to Dayco Corporation, Dayton, Ohio

Division of Ser. No. 633,060, Nov. 18, 1975, Pat. No. 4,013,101, which is a continuation-in-part of Ser. No. 452,471, Mar. 18, 1974, Pat. No. 3,921,674. This application Dec. 3, 1976, Ser. No. 747,268
Int. Cl.[2] B65H *81/08*
U.S. Cl. 156—184 16 Claims

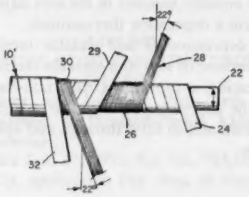

PLACING INNER LAYER PORTION ON A MANDREL
PROVIDING ELONGATED RIBBON OF ELASTOMERIC MATRIX MATERIAL WITH ELONGATED REINFORCING FIBERS PARALLEL TO THE ELONGATED DIMENSION OF THE RIBBON
WRAPPING THE ELONGATED RIBBON IN A HELICAL PATTERN AGAINST THE INNER LAYER PORTION WITH THE RIBBON AND FIBERS EXTENDING IN A HELICAL PATTERN ABOUT A CENTRAL LONGITUDINAL AXIS OF THE INNER LAYER PORTION TO DEFINE AN ASSEMBLY
CURING THE ASSEMBLY TO THEREBY SIMULTANEOUSLY BOND THE LAYERS TOGETHER AS A UNIT AND DEFINE A HOSE CONSTRUCTION

6. A method of making a hose construction comprising the steps of forming a tubular construction having a reference axis and having at least one layer portion made primarily of uncured elastomeric matrix material having randomly distributed elongated fibers embedded therein in substantially parallel relation, said matrix material having a tensile modulus in the direction of fiber orientation higher than the tensile modulus in a direction transverse to said fiber orientation, by winding a layer of said matrix material about a mandrel having a right circular cylindrical outside surface with said fibers extending in a helical pattern about said axis at an angle relative thereto, and curing said tubular construction to define said hose construction having said fibers serving as reinforcement means for said hose construction.

4,106,968
METHOD OF MAKING A FORMED HOSE

Thomas A. Kutnyak, Greenwood; George T. Dunn, and Chester L. Guiles, both of Abbeville, all of S.C., assignors to Automation Industries, Inc., Los Angeles, Calif.

Division of Ser. No. 619,296, Oct. 3, 1975, abandoned. This application Feb. 22, 1977, Ser. No. 770,695
Int. Cl.[2] B65H *81/00*
U.S. Cl. 156—189 8 Claims



1. A method of forming a contoured hose including the steps of:

providing a first cylindrical mandrel being substantially straight and having a relatively hard smooth outer surface;

helically wrapping a first strip of elastomeric material on said first mandrel, said strip being wrapped in an edge-to-edge relationship forming an inner layer having a substantially smooth inner cylindrical core;

helically wrapping a first layer of fiberous strands around said inner layer in a first direction to provide a first inner layer of reinforcement strands, said layer of reinforcement strands being wrapped at an angle in a range between 20° and 30° relative to a line perpendicular to a center axis of said inner cylindrical core;

helically wrapping a second strip of elastomeric material on said layer of fiberous strands of reinforcement material to form a tie-ply for holding said first layer of reinforcement material in position during construction of said hose;

helically wrapping a second layer of fiberous strands around said inner layer, in a second direction, to provide a second layer of reinforcement material, said second direction being opposite to said first direction, said second layer of reinforcement strands being wrapped at an angle in a range between 20° and 30° relative to a line perpendicular to the centerline axis of said cylindrical core;

helically wrapping a third strip of elastomeric material around said second layer of fiberous strands to form an outer cover;

providing a contoured mandrel having a relatively hard smooth surface and being contoured into predetermined shapes;

removing said hose from said straight mandrel before said hose is cured and placing on said contoured mandrel;

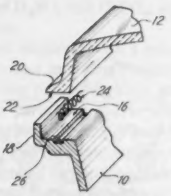
curing said hose on said contoured mandrel by subjecting said hose to an elevated temperature condition for a predetermined time to cause said layers to bond together into a monolithic structure; and

removing said hose from said contoured mandrel after said hose is cured.

4,106,969
METHOD FOR ASSEMBLING TOGETHER PARTS OF AUTOMOBILE LIGHTS

Olivier Puyplat, Paris, France, assignor to Cibie Projecteurs, Bobigny, France

Filed Aug. 18, 1977, Ser. No. 825,633
Claims priority, application France, Sep. 8, 1976, 76 27012
Int. Cl.[2] B29C *19/06;* **B29D** *3/00;* **C09J** *5/00*
U.S. Cl. 156—275 **7 Claims**

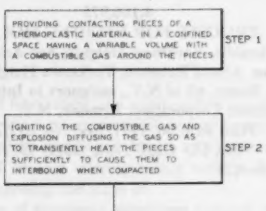


1. In a method for assembling together two parts of headlights or lights for automobile vehicles, the first of said parts being made of an inorganic material and the second of a thermoplastic material not able to be directly fixed to the first by adhesion, a metallic connection element is partially introduced into the second thermoplastic part so that a part of said element projects and acts as free anchoring element, and the two first and second parts are then assembled by the depositing of a layer of glue which, on the one hand, adheres to the first part and, on the other hand, completely covers the said free anchoring element which, after the glue has set, acts as mechanical connection between the two parts, and wherein, in order partially to introduce said connection element in the second part, said connection element is heated for predetermined length of time and a pressure is applied thereto with a view to causing it to penetrate in the thermoplastic material.

4,106,970
METHOD FOR THE THERMAL BONDING OF CONTACTING PIECES OF A THERMOPLASTIC MATERIAL

Christopher J. Torbet, Ann Arbor; Warren A. Rice, Dexter, and Clarence S. Vinton, Ann Arbor, all of Mich., assignors to Chemotronics International, Inc., Ann Arbor, Mich.

Filed Aug. 29, 1977, Ser. No. 828,349
Int. Cl.[2] C09J *5/00*
U.S. Cl. 156—306 **16 Claims**


PROVIDING CONTACTING PIECES OF A THERMOPLASTIC MATERIAL IN A CONFINED SPACE HAVING A VARIABLE VOLUME WITH A COMBUSTIBLE GAS AROUND THE PIECES
STEP 1
IGNITING THE COMBUSTIBLE GAS AND EXPLOSION DIFFUSING THE GAS SO AS TO TRANSIENTLY HEAT THE PIECES SUFFICIENTLY TO CAUSE THEM TO INTERBOUND WHEN COMPACTED
STEP 2
COMPACTING THE PIECES WHILE HEATED BY REDUCING THE VOLUME OF THE CONFINED SPACE TO CAUSE THEM TO BOND
STEP 3

1. The improved method for thermal bonding of contacting pieces of a thermoplastic material to form a bonded porous mass by the ignition of a combustible gas around the contacting pieces forming an unbonded porous mass so as to bond the pieces together which comprises:

(a) providing contacting pieces of a thermoplastic material in a confined space having a variable volume with an initiator means for igniting the combustible gas externally of the confined space, with an explosion diffuser providing a tortuous gas flow path adjacent the porous mass between the initiator means and the porous mass and with a combustible gas around the pieces which form an unbonded porous mass, said volume being reducible to compact the pieces in the unbonded porous mass;

(b) igniting the combustible gas within the unbonded porous mass by activating the initiator means which ignites the combustible gas externally of the confined space and diffuses the ignited gas through the tortuous flow path of the diffuser element so as to transiently heat the pieces sufficiently to cause them to interbond without damage from the ignited combustible gas when they are brought into contact with each other by compacting the unbonded porous mass; and

(c) compacting the pieces while they are heated by reducing the volume of the confined space so as to cause contact of the heated surfaces and to cause bonding and formation of the bonded porous mass.

4,106,971
METHOD OF ADHESIVE BONDING

Paul Clayton Briggs, Jr., Wilmington, and Lawrence Carl Muschiatti, Newark, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 551,964, Feb. 21, 1975, abandoned, which is a division of Ser. No. 357,387, May 4, 1974, Pat. No. 3,890,407, and a continuation-in-part of Ser. No. 273,353, Jul. 20, 1972, abandoned. This application Feb. 18, 1977, Ser. No. 770,059
Int. Cl.[2] B32B *7/00*
U.S. Cl. 156—310 **5 Claims**

1. A method of bonding two surfaces to each other, said method comprising applying to at least one of the surfaces to be joined an adhesive composition consisting essentially of a solution of a sulfur-bearing composition selected from chlorosulfonated polyethylene and a mixture of sulfonyl chloride with chlorinated polyethylene in a polymerizable vinyl monomer and at least one polymerization catalyst selected from the group consisting of an accelerator, an initiator, a promoter, and a free radical generator; the sulfur-bearing composition containing about 25–70 wt. percent chlorine and about 0.1–5 weight percent sulfur and being made from polyethylene having a melt index of about 4–500; said solution having a Brookfield viscosity of up to about 1 million; and then bringing the surfaces sufficiently close together that the adhesive composition fills the gap between the surfaces to create a bond that can be characterized by at least one of the following: the setting time is less than about 10 minutes, the T-peel strength is greater than about 5 pli, the lap shear strength on prepared surfaces is greater than about 2500 psi, and the bond strength on oily surfaces is not significantly adversely affected by the presence of the oil.

4,106,972
VELOCITY COMPENSATOR AND APPARATUS INCORPORATING THE SAME

Donald L. Caudill, Riverside, Calif., assignor to Label-Aire Inc., Fullerton, Calif.

Filed Sep. 26, 1977, Ser. No. 836,779
Int. Cl.[2] B65C *9/40*
U.S. Cl. 156—363 **15 Claims**

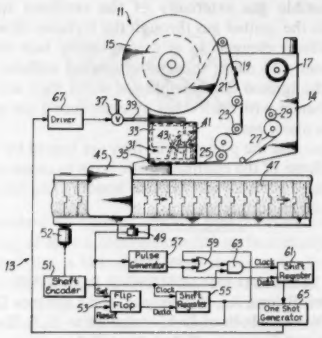
1. A velocity compensator for controlling the initiation of an actuator wherein an article is moved along a path through a work station and actuator performs a work operation on the article at the work station with the actuator requiring an actuation period from the time it is initiated to perform the work operation, said compensator comprising:

first means responsive to movement of the article upstream of the work station for providing a distance signal having a characteristic related to a travel distance which is the distance the article travels in a period equal to the actua-

tion period, said travel distance being no greater than a first predetermined distance;

measuring means for measuring distances having lengths up to a second predetermined distance, said second predetermined distance being at least as great as the travel distance;

said measuring means including means responsive to said distance signal for reducing said second predetermined distance by said travel distance to define a remaining



distance whereby the measuring means is then capable of measuring a distance equal to said remaining distance;

second means responsive to the article reaching a first location which is approximately said second predetermined distance from the work station for providing a first signal to the measuring means; and

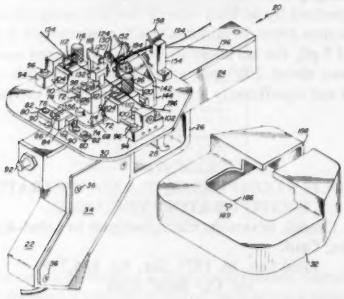
said measuring means including means responsive to the article traveling a distace equal to said remaining distance after the occurrence of said first signal to provide an actuation signal which can be used to initiate the actuator.

4,106,973

YARN WELDING DEVICE

Robert C. Wright, Huntingdon Valley, Pa., assignor to Narricot Industries, Inc., Philadelphia, Pa.

Filed Jan. 17, 1977, Ser. No. 759,616
Int. Cl.[2] B65H *69/08*; B29C *27/06*
U.S. Cl. 156—433 **10 Claims**



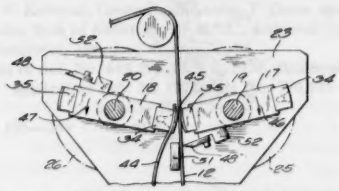
1. A yarn welding device comprising a heating element, means for holding the ends of two lengths of yarn against said heating element, means for energizing said heating element to weld the two ends of said yarn to form a continuous yarn and sever the free ends of said yarn, means for placing the welded yarn under tension and means for molding the weld joint to smooth the same and reduce its size, said molding means comprising a vertically movable molding head that is brought vertically downward against said weld joint and a laterally movable molding blade which is brought to bear against said weld joint, said head and blade cooperating to mold said joint.

4,106,974

FLYING SPLICE APPARATUS

John L. Hirsch, Sheboygan Falls, Wis., assignor to Curt G. Joa, Inc., Sheboygan Falls, Wis.

Filed Sep. 13, 1976, Ser. No. 722,833
Int. Cl.[2] B65H *19/16*
U.S. Cl. 156—504 **7 Claims**



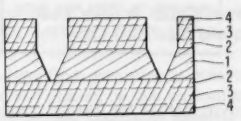
1. Flying splice apparatus for splicing the leading end of a new web to a running web, said apparatus comprising two coacting rotors between which the running web is trained, said rotors being respectively provided with coacting web press jaws, means for rotating said rotors concurrently through a cycle in which said jaws coact to engage the leading end of the new web with the running web, one said jaw comprising a vacuum pad for temporarily holding one side of the leading margin of the new web to said one jaw, an adhesive strip on the other side of the leading margin of the new web and adhered thereto and having an exposed face, the other said jaw comprising an anvil jaw whereby coaction of the jaws will splice the said leading end of the new web to the running web by adhering the exposed face of the adhesive strip to the running web, continued rotation of said rotors through said cycle pulling said leading margin of the new web off of said vacuum pad, each said rotor being provided with both a vacuum pad jaw and an anvil jaw and means mounting said jaws in angularly spaced relation about the axis of rotation of the rotor for successive coaction of a vacuum pad jaw on one rotor with an anvil jaw on the other rotor in each said cycle.

4,106,975

PROCESS FOR ETCHING HOLES

Melvin Berkenblit, Yorktown Heights; See Ark Chan, Croton-on-Hudson; Arnold Reisman, Yorktown Heights, and Stanley Zirinsky, Bronx, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1977, Ser. No. 811,750
Int. Cl.[2] C23F *1/00*; G01D *15/18*
U.S. Cl. 156—628 **17 Claims**



1. A method for etching at least one aperture having well defined crystallographic geometry in single crystal of a mate-

rial selected from the group consisting of aluminum oxide, spinel, yttrium aluminum garnet and yttrium iron garnet which comprises:

(A) providing a substrate of said single crystal;

(B) providing a masking material on all sides of said substrate and providing at least one aperture in said masking material to thereby protect predetermined portions of the substrate from being etched, said masking material being resistant to etching at temperatures of up to about 325° C with mixtures of H_2SO_4 and H_3PO_4; and being adherent to the said substrate;

(C) contacting said substrate with a mixture of sulfuric acid and phosphoric acid in a range of mixtures of nine parts sulfuric acid to one part phosphoric acid to one part sulfuric acid to nine parts phosphoric acid by volume, for a time sufficient to anisotropically etch through said at least one aperture to provide said substrate with at least one aperture having well defined crystallographic geometry, said mixture being at a temperature of about 200° to about 325° C during said contacting.

4,106,976

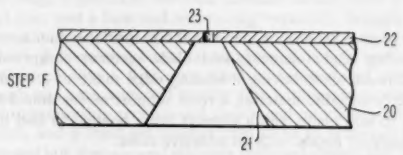
INK JET NOZZLE METHOD OF MANUFACTURE

Charles Chiou, San Jose; Guido Galli, Saratoga; Karl H. Loeffler, San Jose, and Max R. Lorenz, Saratoga, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 665,143, Mar. 8, 1976, abandoned. This application Nov. 9, 1977, Ser. No. 849,920

Int. Cl.² G01D *15/18;* **H01L** *21/306*

U.S. Cl. 156—644 **4 Claims**



1. A method of fabrication of a multi-orifice nozzle plate for pressurized fluid jets a monocrystalline substrate with an array of entrance openings overlayed by an inorganic membrane with an array of orifices corresponding with said openings, said method comprising the steps of:

forming a layer of inorganic membrane material of uniform thickness less than one mil on the front surface of said monocrystalline substrate; said inorganic membrane material having physical characteristics sufficient to withstand said pressurized fluid;

controlled chemical preferential etching said monocrystalline substrate from the rear surface to form an array of uniform openings therethrough to said membrane; and

etching said membrane to form an array of uniform orifices therethrough, each of said orifices communicating with one of said substrate openings having approximately the same central axis therewith, and having smaller areal cross sections than said substrate openings.

4,106,977

PROCESS FOR PRODUCTION OF OIL CONTROL RINGS

Heck Klaus, Ingolstadt, Fed. Rep. of Germany, assignor to Audi Nsu Auto Union Aktiengesellschaft, Fed. Rep. of Germany

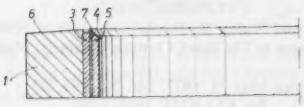
Filed Apr. 26, 1976, Ser. No. 679,890

Claims priority, application Fed. Rep. of Germany, May 9, 1975, 2520698

Int. Cl.² C23F *1/02*

U.S. Cl. 156—645 **6 Claims**

1. A process for production of oil control rings for pistons of internal combustion engines having a smooth and continuous scraper edge formed by a layer of a wear-resistant material, a pair of spaced softer layers, interposing and embedding the wear-resistant layer between the softer layers, then finishing a surface to form a smooth and continuous exposed scraper edge, and then recessing the soft layers on said surface to either side of the wear resistant layer so that the scraper edge will cooperate with associated surfaces of the engine in preventing oil from escaping across the scraper edge.



4,106,978

METHOD OF PREVENTING EXPLOSIONS USING A SMELT WATER EXPLOSION INHIBITOR

Hugh Wharton Nelson, West Hartford, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Jan. 31, 1977, Ser. No. 764,116

Int. Cl.² D21C *11/12*

U.S. Cl. 162—1 **3 Claims**

1. A method of preventing explosions due to water contacting a smelt and forming a layer of water thereon comprising spreading over substantially the entire smelt-water bed a layer of a porous, high surface area powder which is coated with an anti-wetting agent and wherein said porous power contains trapped air and which is more dense than water such that said powder will sink through said water layer without releasing gas and forming a layer at the interface of said water and said smelt which is at least about 0.15 centimeters thick and said air after passing through the water layer is available for forming nucleating sites.

4,106,979
PREPARATION OF PAPER PULPS FROM DICOTYLEDONOUS PLANTS

Guglielmo Ruffini, Lovere, and Erio Pezzotti, Cassano Magnago, both of Italy, assignors to Consorzio Fabocart S.p.A., Milan, Italy

Filed Mar. 21, 1977, Ser. No. 779,293
Int. Cl.[2] D21C *3/02, 3/20, 9/16*
U.S. Cl. 162—73 **7 Claims**

1. A process for the preparation of pulps for paper from dicotyledonous plants, comprising the steps of:

stirring in a pulper, the dicotyledonous plants in an alkaline solution in the presence of a surfactant and at least one stain inhibiting agent selected from the group consisting of peroxides and sodium hypochlorite, which agent prevents staining of the plant fibers in alkaline media by blocking the chromophoric groups of the dicotyledonous plants, in order to obtain a stock containing both a woody core fraction and a bark fraction containing bast fibers;

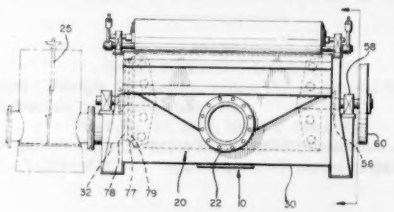
dividing said stock into a woody core fraction and a bark fiber fraction; and then

subsequently cooking and bleaching said bark fraction under atmospheric pressure in an alkaline solution containing an alkyl sulfate surfactant and an oxidizing agent selected from the group consisting of hydrogen peroxide and tertiary butyl hydroperoxide.

4,106,980
THICKENER APPARATUS INCLUDING A SHAFTLESS CYLINDER MOLD

Peter Seifert, and Walter R. Zimmerman, both of Middletown, Ohio, assignors to The Black Clawson Company, Middletown, Ohio

Filed May 11, 1977, Ser. No. 795,703
Int. Cl.[2] D21F *1/04, 1/60*
U.S. Cl. 162—330 **2 Claims**



1. In a thickening apparatus for thickening wood pulp, having a thickening vat, a slurry input, means for providing a controlled supply of supply slurry to said thickening vat, a cylinder mold rotatably supported within said vat, a white water outlet at one end of the cylinder mold for removing white water from the interior of the cylinder mold, a couch roll in driven engagement with the surface of the cylinder mold for removing the thickened slurry from the cylinder mold, and a thickened slurry discharge device for removing the thickened slurry from the couch roll, the improvement comprising:

said cylinder mold having opposed axially aligned end support members with outer cylindrical peripheral surfaces, one of said end members disposed opposite said white water outlet being closed to prevent mixing of the slurry in said vat and white water in said cylinder mold, and the second of said end members adjacent said white water outlet having an open portion extending around substantially said entire second end member so that the interior of said cylinder mold is in communication with said white water outlet to permit white water to flow from the cylinder mold into said white water outlet while said cylinder mold is rotating, each of said end members having separate axially aligned rotation shafts secured thereto by which said cylinder mold is rotatably supported in said vat;

a cylindrical perforated shell member circumferentially secured to said end support members, for rotation therewith, and screening means covering the outer surface of said shell member for controlling the water removal from the slurry into the interior of said cylinder mold;

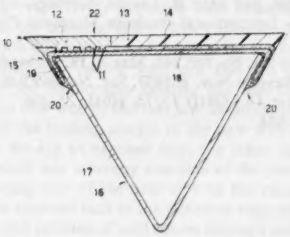
a plurality of stiffening members disposed in axially spaced relation between said end members supportively engaging the inner surface of said shell member and having openings defined therein for flow of white water from said first end member to said second end member; and

said shell member being sufficiently rigid to be self-supporting in conjunction with said stiffening members.

4,106,981
PROCEDURE FOR OBTAINING ELEMENTS TO SUPPORT THE WIRE IN CONTINUOUS FORMING TABLES OF PAPER-MAKING MACHINES, AND THE ELEMENTS DERIVED THEREBY FOR SUPPORTING THE WIRE

Glauco Corbellini, via Carducci, 33100 Udine, Italy

Continuation of Ser. No. 426,657, Dec. 20, 1973, abandoned. This application Aug. 25, 1975, Ser. No. 607,694
Claims priority, application Italy, Dec. 20, 1972, 83450 A/72; Dec. 20, 1972, 83451 A/72
Int. Cl.[2] D21F *1/54*
U.S. Cl. 162—352 **4 Claims**

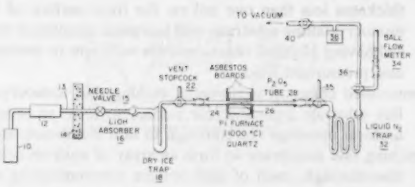


1. In combination a paper-making machine and a water removing blade element, said blade element comprising a pre-formed blade having a leading edge made of a hard ceramic or metallic material; a resin support means united by a resin to said blade, and a support beam bonded to said blade and support means with an adhesive resin.

4,106,982
PRODUCTION OF CARRIER-FREE $H^{11}CN$

David R. Christman, Setauket; Ronald D. Finn, Westhampton Beach, and Alfred P. Wolf, Setauket, all of N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 1, 1974, Ser. No. 456,996
Int. Cl.[2] G21G *1/10*
U.S. Cl. 176—11 **6 Claims**



1. The method of synthesizing $H^{11}CN$ comprising the steps of:

a. subjecting a gaseous mixture of nitrogen and hydrogen to irradiation by a beam of protons having an energy in the range of about 4 to 18 MeV to induce the $^{14}N(p,\alpha)^{11}C$ reaction and produce an effluent containing NH_3 and $^{11}CH_4$;

b. reacting the $^{11}CH_4$ and NH_3 in said effluent to form $H^{11}CN + H_2$; and

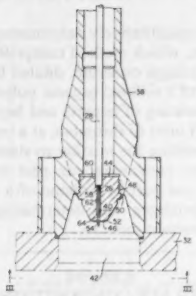
c. removing the H_2, N_2 and remaining NH_3 to obtain $H^{11}CN$.

4,106,983

THERMOCOUPLE HOT JUNCTION RECEPTACLE FOR A NUCLEAR REACTOR

Robert E. Meuschke, Penn Hills Township, Allegheny County, Pa., and Jose M. Martinez, Miami, Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 15, 1976, Ser. No. 649,182
Int. Cl.[2] G21C *17/02*
U.S. Cl. 176—19 R **3 Claims**



1. A receptacle to seat a thermocouple within the reactor vessel and above the core of a nuclear reactor, said thermocouple including a sheath and a hot junction of smaller cross section than said sheath protruding therefrom, said thermocouple disposed within a conduit that penetrates said reactor vessel and terminates within said receptacle, said receptacle comprising a generally inverted conical surface with a flattened apex and a base and an opening vertically through said receptacle intersecting said flattened apex and base, said opening having decreasing lateral areas along its length, said areas serially including a first area sized to receive said conduit through said base, a second smaller area within said receptacle sized to removably receive said sheath and interfere with said conduit, and a third yet smaller area sized to removably receive said hot junction and interfere with said sheath, said third cross section extending to said apex and having a shorter length than said hot junction, whereby said hot junction protrudes beyond said apex.

4,106,984

ROTATING SAFETY DRUM NUCLEAR REACTOR

Richard T. Schneider, 3550 NW. 33rd Pl., Gainesville, Fla. 32605

Filed Sep. 28, 1976, Ser. No. 727,485
Int. Cl.[2] G21C *7/08*
U.S. Cl. 176—32 **9 Claims**

1. A nuclear reactor, comprising:

a rotatable drum;

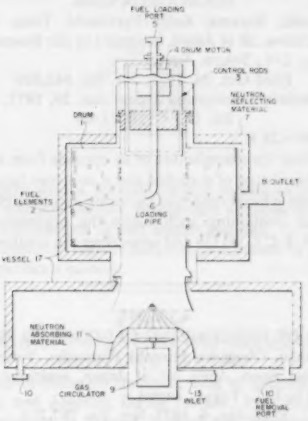
means for rotating said drum about its longitudinal axis when said reactor is operative thereby inducing centrifugal forces within said drum;

a plurality of solid fuel elements disposable within said drum, said fuel elements moving to a desired configuration about said longitudinal axis upon the application of said centrifugal forces thereby forming a central cavity within said drum;

means for loading said fuel elements within said drum;

a plurality of control rods insertable within said cavity and proximate said longitudinal axis, said control rods being spaced such that the distance between adjacent rods is less than the diameter of a fuel element;

means for partially inserting said control rods into said cavity when said reactor is operative and for fully inserting said control rods into said cavity when said reactor is not operative in order to retain said fuel elements between the walls of said drum and said control rods;



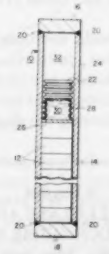
whereby when said reactor is operative and said control rods are not fully inserted, said fuel elements are held fixed along the walls of said drum by said centrifugal forces and form a critical mass within said desired configuration, and when said reactor is not operative and said control rods are fully inserted, said fuel elements are retained within said drum in a subcritical condition.

4,106,985

FUEL ELEMENT FOR A NUCLEAR REACTOR

Joseph Molloy, Deal, England, and William G. Clarke, Monroeville, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 24, 1976, Ser. No. 717,077
Int. Cl.[2] G21C *3/16*
U.S. Cl. 176—68 **2 Claims**



1. A fuel element for a nuclear reactor comprising:

a sealed generally tubular sheath containing nuclear fuel;

a sealed hollow flexible bellows member disposed entirely within said sheath and capable of deforming in response to pressure changes;

a gas disposed in said sheath surrounding said flexible bellows member for exerting a uniform internal pressure on said sheath; and,

water disposed in said flexible bellows member responsive to

the temperature and pressure of the environment in and around said sheath for causing said sealed flexible bellows member to deform thereby maintaining the internal sheath pressure substantially equal to the external sheath pressure.

4,106,986

MANUFACTURE OF EPOXIDE USING A MICROORGANISM

Shuzo Suzuki, Sayama; Keizo Furuhashi, Toda, and Akira Taoka, Urawa, all of Japan, assignors to Bio Research Center Company, Ltd., Tokyo, Japan

Filed Oct. 14, 1977, Ser. No. 842,029

Claims priority, application Japan, Jun. 24, 1977, 52-75127

Int. Cl.[2] C12D *13/00*

U.S. Cl. 195—28 R **2 Claims**

1. A method for manufacture of an epoxide from an olefin of the group consisting of α-olefins and α,ω-dienes having 4 to 20 carbon atoms which comprises culturing aerobically in a nutrient medium containing such olefin the organism Nocardia corallina, A.T.C.C. 31338 and separating the resulting epoxide therefrom.

4,106,987

METHOD OF ISOMERIZING GLUCOSE TO FRUCTOSE

Tomoei Kanno, Okegawa; Hiroaki Watanabe, Yokohama, and Shohachiro Sano, Ageo, all of Japan, assignors to Showa Sangyo Co. Ltd., Tokyo, Japan

Filed Jan. 6, 1977, Ser. No. 757,211

Claims priority, application Japan, Jan. 8, 1976, 51-1789; Jan. 16, 1976, 51-4462

Int. Cl.[2] C12D *13/00*

U.S. Cl. 195—31 F **3 Claims**

1. A method of isomerizing glucose to fructose which comprises contacting a stream of an aqueous glucose solution with a hydrogel of an edible substance and thereafter with an anion exchange resin, said hydrogel containing dispersed cells of a microorganism having glucose isomerase activity.

4,106,988

METHOD OF CULTIVATING *METHYLOMONAS PROBUS* ON METHANOL CONTAINING MEDIUM

Katsuhisa Ohsugi; Daizo Takeuchi; Masahiro Hamada, and Tamotsu Kano, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 22, 1977, Ser. No. 770,655

Int. Cl.[2] C12B *1/00*

U.S. Cl. 195—49 **5 Claims**

1. A method of producing microbial cells usable as protein source, which comprises cultivating the bacterium Methylomonas probus aerobically in a medium containing methanol as a carbon source, nitrogen and inorganic nutrient sources, and separating, then collecting the thus propagated microbial cells of said bacterium.

4,106,989

THERMOSTABLE CELLULASE AND A METHOD FOR PRODUCING THE SAME

Ichiro Komura, Kawasaki; Takeyoshi Awao, and Kazuhiko Yamada, both of Fujisawa, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Apr. 26, 1977, Ser. No. 791,013

Claims priority, application Japan, Apr. 30, 1976, 51-49463

Int. Cl.[2] C12D *13/10*

U.S. Cl. 195—62 **5 Claims**

1. A cellulase produced by Sporotrichum cellulophilum and having the following properties:

(a) hydrolyzes microcrystalline cellulose, hydrocellulose, sulfite pulp, filter paper, and cotton mainly to glucose and to a small amount of cellobiose;

(b) optimum activity on Whatman No. 1 filter paper at pH 5.5 to 6.5 and at 60° C.;

(c) optimum activity at 60° to 65° C.;

(d) more than 50% of initial activity is retained at 50° C for 4 hours at any pH from 4.0 to 7.0;

(e) stable when heated without any substrate at 50° C.;

(f) retaining more than 40% of initial activity when heated at 80° C. for 1 hour without any substrate.

4,106,990

QUANTITATIVE DETERMINATION OF ANTITHROMBIN III

Hermann Erich Karges, and Norbert Heimburger, both of Marburg, Lahn, Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg, Lahn, Fed. Rep. of Germany

Filed Jun. 10, 1976, Ser. No. 694,815

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1976, 2601372

Int. Cl.[2] G01N *31/14;* **C07G** *7/02*

U.S. Cl. 195—63 **3 Claims**

1. A method for quantitatively determining antithrombin III in plasma or serum, which method comprises combining

(a) 1 ml of said plasma or serum, diluted by at least 1 to 50,

(b) 0.2 to 10 IU of a sulfated organic polymer selected from the group consisting of heparin and heparinoids, and

(c) 0.5 to 20 NIH units of thrombin, at a temperature of 4° C to 45° C, permitting the mixture to stand for 2 to 20 minutes, thereafter combining one part by volume of the mixture with one part by volume of a 0.05 to 1 percent solution of fibrinogen, and determining the coagulation time of the resultant mixture.

4,106,991

ENZYME GRANULATE COMPOSITION AND PROCESS FOR FORMING ENZYME GRANULATES

Erik Kjaer Markussen, Vaerloese, and Arne Wintherhalter Schmidt, Skovlunde, both of Denmark, assignors to Novo Industri A/S, Bagsvaerd, Denmark

Filed Jun. 28, 1977, Ser. No. 810,884

Claims priority, application United Kingdom, Jul. 7, 1976, 28343/76

Int. Cl.[2] C07G *7/02*

U.S. Cl. 195—63 **11 Claims**

10. A granulate composition comprising enzyme, inorganic salts, a granulation binder, and finely divided cellulose fibers as 2–40% w/w of the granulate.

4,106,992

PURIFICATION OF UROKINASE

Edmond G. Vairel, Paris; Jean Goulay, Oissel, and Jean Choay, Paris, all of France, assignors to Choay S.A., Paris, France

Division of Ser. No. 292,139, Sep. 25, 1972, U.S. Pat. 3,926,727.

Filed Nov. 5, 1975, Ser. No. 628,968

Claims priority, application France, Sep. 24, 1971, 71.34345; Jun. 30, 1972, 72.23867; Jun. 30, 1972, 72.23868

Int. Cl.[2] C07G *7/02*

U.S. Cl. 195—66 B **17 Claims**

1. A method for obtaining a purified or purer solution of urokinase from a starting solution of crude urokinase containing proteins and pyrogens which comprises contacting a crude urokinase solution having a pH of about 4 to 6 and a conductivity of about 15,000 to 25,000 micromhos with a diethylaminoethylcellulose resin, adsorbing proteins and pyrogens on the resin, thereby forming a urokinase-enriched solution which is not retained by the resin, separating the urokinase-enriched solution and collecting the urokinase-enriched solution.

9. A method of obtaining a solution enriched in urokinase from an initial solution of crude urokinase containing proteins and pyrogens, which comprises contacting the crude urokinase solution which has a pH of about 6 to 7 and a conductivity of at least 15,000 micromhos with a diethylaminoethylcellulose resin, the weight of the resin relative to the activity in urokinase of the solution being sufficiently high for causing a notice-

able retention of proteins on the resin under such conditions of conductivity and of pH, said weight not however exceeding that for which there would also be observed a non-negligible retention of urokinase on the resin; adsorbing proteins and pyrogens on the resin, thereby forming a urokinase-enriched solution and collecting the urokinase-enriched solution.

4,106,993

METHOD FOR PRESERVATION OF AQUEOUS GLUCOSE ISOMERASE SOLUTION

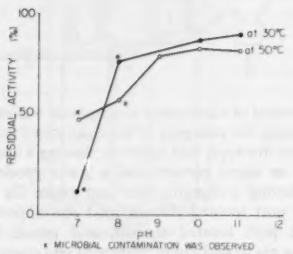
Tetsuya Hirota, Fujisawa; Tadashi Hishida, Tokyo; Akira Kamata, Yokohama; Isao Nakazawa, Kawasaki, and Hiroshi Takamisawa, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Mar. 15, 1977, Ser. No. 777,685

Claims priority, application Japan, Mar. 17, 1976, 51-28963

Int. Cl.[2] C07G *7/02;* **C12K** *1/00*

U.S. Cl. 195—65 **10 Claims**



1. A method for preservation of an aqueous glucose isomerase solution comprising adjusting the pH value of the aqueous solution to a range of from 9 to 12, wherein said aqueous solution is stored for a period of not less than three days.

4,106,994

PROCESS FOR PRODUCING STEFFIMYCINOL

Vincent P. Marshall, Portage; David W. Elrod, Kalamazoo; James M. Koert, Kalamazoo; Elizabeth A. Reisender, Kalamazoo, and Paul F. Wiley, Kalamazoo, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 782,621, Mar. 30, 1977, Pat. No. 4,077,844. This application Nov. 16, 1977, Ser. No. 851,866

Int. Cl.[2] C12D *9/14*

U.S. Cl. 195—80 R **6 Claims**

1. A process for preparing the antibiotic steffimycinol which comprises cultivating *Streptomyces nogalater* var. nogalater, having the identifying characteristics of NRRL 3035, in an aqueous nutrient medium under aerobic conditions in the presence of the antibiotic steffimycinone until substantial conversion of steffimycinone to steffimycinol, and recovering steffimycinol.

4,106,995

MICROORGANISM GROWTH INHIBITOR DEVICE

Oscar Johan Petersen, Orange, and Timothy Frank Scott, Brea, both of Calif., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Aug. 5, 1976, Ser. No. 711,489

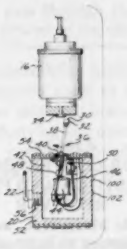
Int. Cl.[2] C12B *1/20*

U.S. Cl. 195—103.5 R **7 Claims**

1. The combination of an oxygen cell having an oxygen permeable membrane for immersion in an aqueous culture of a microorganism and a device for the inhibition of microorganism growth on the surface of said membrane, said device comprising:

(1) a source of an antiseptic having a limited water solubility sufficient to inhibit microorganism growth in the locality of said membrane but insufficient to inhibit said growth in the main body of said culture;

(2) carrier means bearing said source;



(3) transport means for said carrier means to sweep said source carried thereby within said aqueous culture and across said surface of said membrane; and

(4) drive means to actuate said transport means in a continuous repetitious manner.

4,106,996

METHOD OF IMPROVING THE MECHANICAL RESISTANCE OF COKE

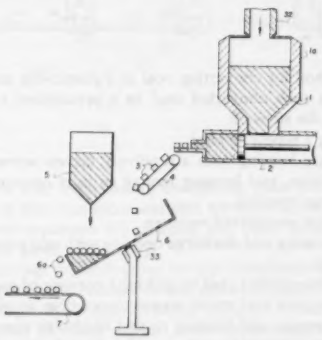
Werner Wenzel; Heinrich Gudenau, both of Intzestr., Aachen, Germany, and Joachim Bernt, Aachen, Fed. Rep. of Germany, assignors to Werner Wenzel and Heinrich Wilhelm Gudenau, both of Germany

Continuation-in-part of Ser. No. 613,461, Sep. 15, 1975, abandoned. This application Jun. 28, 1977, Ser. No. 811,147

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1974, 2444066; Nov. 29, 1974, 2456437

Int. Cl.[2] C10B *47/10, 53/08, 51/00*

U.S. Cl. 201—6 **4 Claims**



1. A method of improving the mechanical resistance of coke, comprising forming a liquor of fine grained coal and oil, with the oil being approximately 5% to 30% of the total weight, forming briquettes from the liquor at an elevated temperature in the range of approximately 80° C to 100° C, delivering said briquettes to a rotating cylinder having a parting ring therein between the ends thereof, rotating said cylinder to transform said briquettes into rounded pellets, discharging said pellets by passing said pellets through said parting ring and out of said rotating cylinder, passing said discharged pellets to a coke oven chamber and placing said pellets in said chamber to form spaces therebetween, heating said pellets in said coke oven chamber to form an improved coke by directing hot gas through said spaces between said pellets, from openings provided in the bottom of said chamber, until said spaces become clogged by the fusing coal, said hot gases comprising gases from a coke oven chamber which is already heated up to a correspondingly high temperature, and recycling oils pro-

duced during the coking process and separated from said heating gases to form part of said liquor.

4,106,997

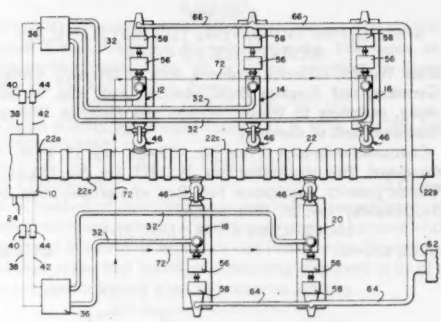
METHODS FOR CONVERTING COAL TO A PLASTIC-LIKE CONDITION AND FEEDING SAME TO A RECEIVER

Victor Kevorkian, Belle Mead, N.J., and Francis J. Cumings, Windham, N.H. assignors to Ingersoll-Rand Research, Inc., Princeton, N.J.

Continuation of Ser. No. 698,170, Jun. 21, 1976, abandoned, which is a continuation of Ser. No. 529,037, Dec. 3, 1974, Pat. No. 3,976,548. This application Apr. 13, 1977, Ser. No. 787,087

Int. Cl.[2] C10B *47/20*

U.S. Cl. 201—32 **6 Claims**



1. A method for converting coal to a plastic-like condition and feeding such converted coal to a pressurized receiver, comprising the steps of:

providing a supply of coal;

providing a housing with a rotatively driven screw means therewithin, said housing having an inlet opening and a discharge opening;

providing a pressurized receiver;

communicating said discharge opening with said pressurized receiver;

feeding the supplied coal to said inlet opening of said housing, to cause said screw means therewithin to move the coal through said housing to said discharge opening for discharge thereof to said pressurized receiver;

heating the coal, during movement thereof through said housing by said screw means, to a given temperature, of at least about 750° to 800° F, which is sufficiently great to effect conversion of the coal to said plastic-like condition; wherein

said step of heating the coal to a given temperature, during movement thereof through said housing by said screw means, comprises conducting a continuous flow of hot, energized, fluid through said screw means to heat said screw means, and to cause the latter to heat the coal; and

further comprising the step of breaking up the converted coal, prior to discharge thereof from said housing to said receiver, by venting said continuous flow of energized fluid from openings in a terminal end of said screw means and addressing the venting fluid to the converted coal which has been moved through the housing to the discharge opening thereof.

4,106,998

METHOD OF RESTRAINING EMISSION FROM COKE QUENCHING EQUIPMENT

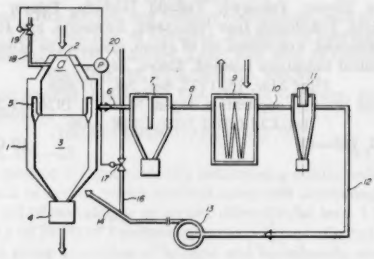
Yutaka Okada; Kyoji Sasaguri, and Kazuo Ishihara, all of Yokohama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 21, 1974, Ser. No. 516,826

Claims priority, application Japan, Oct. 25, 1973, 48/119433

Int. Cl.[2] C10B *45/00, 27/04*

U.S. Cl. 201—39 **1 Claim**



1. A method of eliminating atmospheric emission of dust and smoke during the charging of hot coke into a quenching apparatus of the dry type, said apparatus having a quenching chamber with an upper portion and a lower protion, said upper portion having a charging port and means for covering said charging port located thereat, said lower portion having a discharge port located thereat, and means for supplying quenching gas to said lower portion of said quenching chamber and means for exhausting said gas from said chamber after quenching of said coke; said method comprising the steps of

(A) Opening said covering means;

(B) charging said coke into said chamber through said charging port while said covering is open;

(C) bleeding said gas from said gas supplying means to outside of said chamber concurrently with the charging of said coke into said chamber through said charging port;

(D) preventing gas from being bled from the upper portion of said chamber concurrently with the charging of said coke into said chamber, whereby the internal pressure of said upper portion of said chamber is selectively controlled to be within the range of 0 to -30 mmH_2O during the charging of said coke through said opening of said charging port with said covering means being open thereby to prevent emission of dust and smoke through said open charging port into the atmosphere during said charging of said coke;

(E) and closing said covering means after completion of charging of said coke into said chamber.

4,106,999

CONTINUOUS THERMAL REACTOR

Edward Koppelman, 4424 Bergamo Dr., Encino, Calif. 91316, and Robert G. Murray, Palo Alto, Calif., assignors to Edward Koppelman, Encino, Calif.

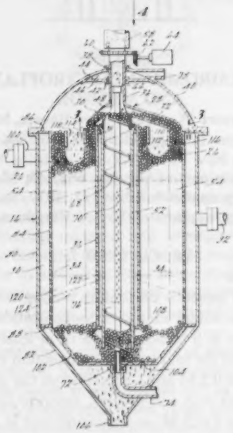
Continuation-in-part of Ser. No. 682,600, May 3, 1976, Pat. No. 4,069,107. This application Nov. 7, 1977, Ser. No. 849,176

Int. Cl.[2] C10B *49/18*

U.S. Cl. 202—118 **17 Claims**

1. A thermal reactor comprising a reactor vessel defining an elongated upright reaction chamber including upper and lower end portions, a rotary distributor in the upper portion of said chamber for introducing a particulated carbonaceous feed material and preheated pebbles into said chamber and a residue outlet in the lower portion of said chamber for withdrawing the pyrolyzed residue therefrom, a separator in the lower portion of said chamber for separating the pyrolized residue from the pebbles, a pebble lift conduit having upper and lower end portions and extending longitudinally of said chamber

having a pebble inlet in the lower end thereof and a pebble outlet in the upper end portion thereof, conveying means in said lift conduit for conveying separated pebbles from said pebble inlet upwardly for discharge from said pebble outlet into said rotary distributor, gas supply means disposed in communication with said lift conduit for introducing an oxidizing gas for combustion of the carbonaceous residue on the pebbles and to provide a preheating of said pebbles during their ascending movement, vent means disposed in communication with the upper portion of said lift conduit for withdrawing said oxidizing gas and combustion products exteriorly of said chamber, supply means for supplying feed material to said rotary distributor, drive means for rotating said rotary distributor for



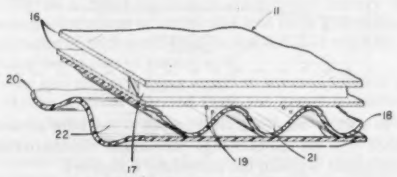
mixing a portion of the preheated pebbles with the feed material in the form of a downwardly moving columnar reaction mass and for distributing the remaining portion of the pebbles substantially devoid of any feed material in the form of a downwardly moving upstream layer and a downwardly moving downstream layer overlying and surrounding said reaction mass, a gas inlet for introducing a gas into said reaction chamber along a region intermediate of said rotary distributor and said separator for passage substantially transversely through said upstream layer, said reaction mass and said downstream layer; and a gas outlet for withdrawing the gas and gaseous pyrolysis products from said reaction chamber along a region disposed adjacent the said downstream layer and transversely spaced from said gas inlet.

4,107,000

SOLAR STILL

Cedric G. Currin, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Sep. 29, 1975, Ser. No. 617,555
Int. Cl.[2] B01D *1/00, 3/00*
U.S. Cl. 202—188 **6 Claims**



1. A solar still comprising

a first corrugated sheet of solar energy absorbent material adapted to have the lower portions of one side thereof filled with water to be distilled, said lower portions thereby forming water channels,

a plurality of vent holes through said corrugated sheet in the raised portions thereof whereby water evaporated from the channels can pass through the sheet to the spaces under the raised portions of the sheet between said channels,

a first solar energy transmitting panel resting on uppermost part of said corrugated sheet to close the tops of said channels except for said vent holes, and

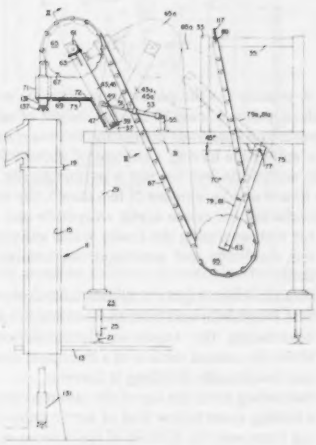
condenser means underlying said corrugated sheet, in which evaporated water passing through said vent holes may condense and be drained from the system.

4,107,001

HIGH PRESSURE WATER CLEANER FOR ASCENSION PIPES

Raymond Carl Kinzler, Carnegie, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Aug. 12, 1977, Ser. No. 823,947
Int. Cl.[2] C10B *43/08*
U.S. Cl. 202—241 **7 Claims**



1. In a coke oven battery comprising coke oven chambers having at least one ascension pipe for each such chamber, an improved apparatus for cleaning the inner surfaces of said ascension pipes, comprising:

a. a carriage movable along the top of said coke oven battery in proximate relation to said ascension pipes;

b. first pivotable support means mounted to said carriage;

c. second pivotable support means mounted to said carriage in spaced apart relation to said first support means;

d. flexible carriage means anchored at one end to said carriage and said flexible carriage means adapted to be carried by and guided by said first support means and said second support means;

e. fluid conduit means operably connected to and supported by said flexible carriage means;

f. at least one spray means connected to said fluid conduit means, said spray means adapted to receive fluid under pressure from said fluid conduit means and said fluid emerging from said spray means to impinge on the inner surface of said selected ascension pipe and wash away encrusted matter thereon;

g. means connected to said first pivotable support means for pivoting it away from and toward said ascension pipes whereby at least one spray means is positionable above a selected one of said ascension pipes; and

h. means acting upon said flexible carriage means for lower-

ing and raising said at least one spray means and said conduit means in and out of said selected ascension pipe.

4,107,002

PROCESS FOR THE PURIFICATION OF CRUDE ACETIC ANHYDRIDE

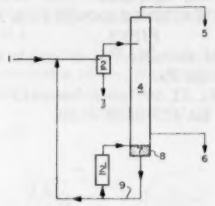
Herbert Eck; Elmar Bethe; Hans Schwarzbauer; Hellmuth Spes, and Klaus Kaiser, all of Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Feb. 2, 1976, Ser. No. 654,309

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1975, 2505471

Int. Cl.[2] B01D *1/00, 3/14;* **C07C** *53/12*

U.S. Cl. 203—75 **5 Claims**



1. A process for the purification of crude acetic anhydride, which contains at least 89.5% by weight of acetic anhydride, by continuous fractional distillation to obtain substantially pure acetic anhydride having a content of above 98% by weight of acetic anhydride and having a permanganate number of less than 10 and a color number of less than 5, the steps comprising:

introducing the crude acetic anhydride into a first evaporator and separating the crude acetic anhydride into vaporous distillable and non-vaporous non-distillable components;

thereafter removing the non-distillable components from the first evaporator and from the purification process and then introducing the vaporous distillable components into about the central section of a fractional distillation column and fractionally distilling it therein;

withdrawing from the top of the column components having a boiling point below that of acetic anhydride, withdrawing from near the bottom of the column substantially pure acetic anhydride having a content of above 98% by weight of acetic anhydride and having a permanganate number of less than 10 and a color number of less than 5, and removing from the sump of the column a liquid residue consisting substantially of crude acetic anhydride and accumulated impurities having a boiling point higher than that of acetic anhydride; said fractional distillation being the sole fractional distillation of said pure acetic anhydride and

returning up to about 8% by weight of the liquid residue to said first evaporator, based upon the initial amount of crude acetic anhydride introduced into the first evaporator.

4,107,003

METHOD OF MANUFACTURING A SEAMLESS CYLINDRICAL STENCIL AND A SMALL-MESH STENCIL OBTAINED BY APPLYING THIS METHOD

Lodewijk Anselrode, St. Anthonis, Netherlands, assignor to Stork Brabant B.V., Boxmeer, Netherlands

Filed Jun. 27, 1977, Ser. No. 810,381

Claims priority, application Netherlands, Jun. 29, 1976, 7607139

Int. Cl.[2] C25D *1/08, 7/04*

U.S. Cl. 204—16 **5 Claims**

1. A method of manufacturing a seamless cylindrical stencil comprising the steps of shrinking, a non-metal hose upon a formfix netting defining a supporting sleeve;

providing the threads of the non-metal hose and eventually of the netting with a conducting surface, and

securing the hose upon the netting by means of an electroplating deposit with a thickness which is smaller than half the diameter of the threads of the hose.

4,107,004

TRIVALENT CHROMIUM ELECTROPLATING BATHS AND METHOD

John Joseph Bernard Ward, and Clive Barnes, both of Wantage, England, assignors to International Lead Zinc Research Organization, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 668,443, Mar. 19, 1976, abandoned. This application Nov. 21, 1977, Ser. No. 853,326

Claims priority, application United Kingdom, Mar. 26, 1975, 12776/75

Int. Cl.[2] C25D *3/06*

U.S. Cl. 204—51 **9 Claims**

1. A trivalent aqueous chromium plating solution comprising trivalent chromium ions in a concentration of at least 0.2 M, sulphate ions in a concentration of at least 0.3 M, a weak complexing agent for said trivalent chromium ions in a concentration of at least 0.1 M and selected from the group consisting of hypophosphite ions and glycine, fluoride ions in a concentration of at least 0.025 M, and chloride ions in a concentration of at least 0.1 M.

4,107,005

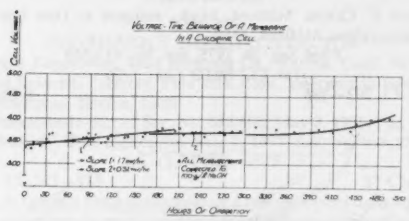
PROCESS FOR ELECTROLYSING SODIUM CHLORIDE OR HYDROCHLORIC ACID, AN AND ELECTROLYTIC CELL, EMPLOYINC TRIFLUOROSTYRENE SULFONIC ACID MEMBRANE

Vincent F. D'Agostino, Huntington Station; Joseph Y. Lee, Lake Grove, and Edward H. Cook, Jr., Lewiston, all of N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls and RAI Research Corporation, Hauppauge, both of, N.Y., part interest to each

Division of Ser. No. 535,636, Dec. 23, 1974, Pat. No. 4,012,303. This application Nov. 11, 1976, Ser. No. 741,163

Int. Cl.[2] C25B *1/16, 1/24, 13/08*

U.S. Cl. 204—98 **11 Claims**



7. In a chlor-alkali electrolytic cell comprising an anode, a cathode and an ion-exchange membrane therebetween, the improvement wherein the membrane comprises:

a. an inert polymeric film

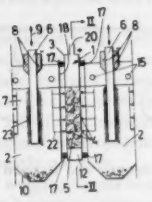
b. a perfluoro vinyl monomer irradiation-grafted on said film, and

c. a pendant ion-exchange group on said vinyl monomer.

4,107,006
ELECTROLYSIS CELL

René Fernand Paul Winand, Rixensart, Belgium, assignor to Université Libre de Bruxelles, Brussels, Belgium

Filed Jul. 6, 1976, Ser. No. 703,007
Claims priority, application Belgium, Jul. 11, 1975, 831295
Int. Cl.[2] C25C *1/10, 7/00, 7/04*
U.S. Cl. 204—105 M **12 Claims**



1. An electrolysis cell for treating inside the anode compartment a divided solid reactant, notably a powdered or fragmented material, which comprises, a cathode compartment being made from a solid electrical conducting material, a container forming an anode compartment and being made from an electrical conducting material and arranged to contain the solid reactant, at least one side wall of said anode compartment being permeable to allow the flow of an electrolyte from the cathode compartment to the anode compartment but which prevents the passage of the solid material from the anode compartment to the cathode compartment, and means for causing a substantially continuous flow of electrolyte from the cathode compartment to the anode compartment.

11. Method for using an electrolysis cell as defined in claim 1 for elaborating manganese metal from ferromanganese, in which to the anode compartment is fed the solid phase from the attack of ferromanganese by iron chloride in molten chlorides and to the cathode compartment is fed the electrolyte formed by the liquid phase from said attack in a molten chloride bath, said liquid phase having been subjected thereafter to purifying with an excess ferromanganese to remove the unreacted iron chloride, manganese-poor electrolyte loaded back with iron chloride being extracted from the anode compartment while manganese metal settling on the cathode is extracted from the cathode compartment.

4,107,007
PROCESS FOR THE RECOVERY OF LEAD FROM SCRAPPED LEAD BATTERIES

Andreas F. Gäumann, Feldmeilen, and Visnja Dancilovic-Matulas, Wettingen, both of Switzerland, assignors to Gesellschaft zur Förderung der Forschung an der Eidgenössischen Technischen Hochschule, Zürich, Switzerland

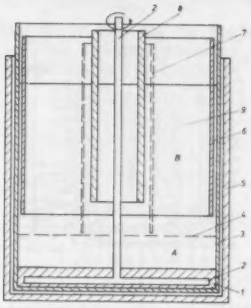
Filed May 9, 1977, Ser. No. 795,418
Claims priority, application Switzerland, May 14, 1976, 6059/76
Int. Cl.[2] C25C *1/18, 1/00*
U.S. Cl. 204—116 **16 Claims**

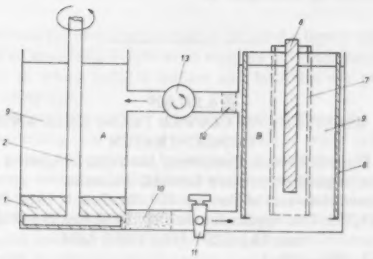
1. A process for recovering lead from scrap lead-acid storage batteries, which comprises the steps of:

placing in a dissolving vessel comminuted battery scrap comprising pieces of antimonial lead from grid plates and particles of lead metal, lead oxides and lead sulphate, said scrap being free of battery acid;

feeding into said dissolving vessel an aqueous solution of an alkaline material selected from the group consisting of alkali metal hydroxides, alkali metal carbonates, ammonium hydroxide and ammonium carbonate, wherein the concentration of said alkaline material in said aqueous solution is at least 5 molar, and thereby dissolving said lead oxides and lead sulphate in said aqueous solution to provide lead ions in said aqueous solution;

feeding said aqueous solution containing dissolved lead oxides and lead sulphate from said dissolving vessel into an electrolysis cell while retaining undissolved antimonial lead and lead metal in said dissolving vessel;





subjecting said aqueous solution in said electrolysis cell to electrolysis to form particles of lead metal at the cathode thereof and removing said particles of lead metal from said electrolysis cell.

4,107,008
ELECTROLYSIS METHOD FOR PRODUCING HYDROGEN AND OXYGEN

Stephen Horvath, St. Ives, Australia, assignor to Beeston Company Limited, Hong Kong, Hong Kong

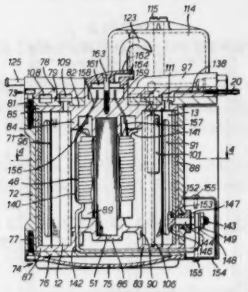
Continuation-in-part of Ser. No. 586,080, Jun. 16, 1975, abandoned, and Ser. No. 632,579, Nov. 17, 1975, said Ser. No. 586,080, is a continuation-in-part of Ser. No. 527,083, Nov. 25, 1974, Pat. No. 3,954,592, said Ser. No. 632,579, is a continuation-in-part of Ser. No. 527,085, Nov. 25, 1974, Pat. No. 3,980,053, said Ser. No. 527,083, and Ser. No. 527,085, each is a continuation-in-part of Ser. No. 485,498, Jul. 3, 1974, abandoned. This application Dec. 22, 1976, Ser. No. 753,610
Int. Cl.[2] C25B *1/04*
U.S. Cl. 204—129 **14 Claims**

1. A method of decomposition of water to produce hydrogen and oxygen comprising the steps of

placing an electrically conductive aqueous solution in a vessel in contact with a pair of separated electrodes,

causing electric current to flow between said electrodes while simultaneously irradiating the aqueous solution with electromagnetic radiation of wave length less than 10^{-10} meters and a stream of neutrons, and

collecting hydrogen and oxygen which accumulates at the electrodes as highly ionised gases in which the hydrogen



contains a higher proportion of deutrons than in naturally occurring hydrogen.

4,107,009

RECOVERY OF COPPER FROM ORES AND CONCENTRATES

Peter Kenneth Everett, Castlecrag, Australia, assignor to Dextec Metallurgical Proprietary Limited, Australia

Continuation-in-part of Ser. No. 654,391, Feb. 2, 1976, Pat. No. 4,061,552. This application Jul. 18, 1977, Ser. No. 816,450

Int. Cl.[2] C25C *1/12*; C25B *1/04*

U.S. Cl. 204—129 **12 Claims**

1. A process for extracting copper from a copper and iron-bearing ore or concentrate which comprises forming a slurry of the ore or concentrate with an electrolyte, intimately mixing finely dispersed oxygen-bearing gas with the slurry and maintaining the slurry and the mixture at substantially atmospheric pressure throughout the process and at a temperature of from 50° C to the boiling point of the electrolyte, said electrolyte being acidic and containing chloride ions in a concentration between that sufficient to maintain in solution a major portion of the dissolved copper as cuprous ions and saturation, and maintaining the pH of the mixture at above 1.5 and less than 7.0 throughout the process, whereby iron solubilized in the process is substantially simultaneously precipitated as ferric oxide and sulfide sulfur oxidized under the conditions is substantially converted to elemental form and the copper is taken into solution.

4,107,010

PHOTO-ELECTROLYTIC PRODUCTION OF HYDROGEN

Russell Gilbert Meyerand, Jr., Glastonbury; Nicholas Leo Krascella, Manchester, and David Gue McMahon, West Hartford, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 725,302, Sep. 21, 1976, Pat. No. 4,069,120. This application Oct. 20, 1977, Ser. No. 843,992

Int. Cl.[2] C25B *1/02*

U.S. Cl. 204—129 **2 Claims**

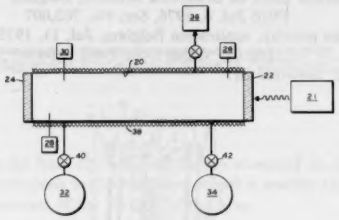
1. A process of producing electrical power which comprises:

forming a water/halogen gas mixture;

irradiating the mixture with radiation energy in the visible spectrum to form the corresponding hydrogen halide and oxygen;

separating the hydrogen halide from the oxygen;

electrolytically decomposing the hydrogen halide to produce hydrogen; and



combining the hydrogen and oxygen to produce electrical power.

4,107,011

METHOD OF REGENERATION OF SPENT ETCHING SOLUTIONS

Vladimir Ilich Kucherenko, ulitsa Sverdlova, 93, kv. 77; Valery Nikolaevich Flerov, ulitsa Kovalikhinskaya, 30, kv. 80; Georgy Vladimirovich Korolev, ulitsa Vaneeva, 49, kv. 12, all of Gorky; Evgeny Pavlovich Kotov, ulitsa Nedelina, 34, korpus 3, kv. 7, Moscow; Anatoly Mikhailovich Praporov, ulitsa Belovezhskaya, 77, kv. 159, Moscow; Galina Alexandrovna Batova, ulitsa Pravdy, 11, kv. 129, Moscow; Gayane Leonovna Melikova, ulitsa Orshanskaya, 4, kv. 49, Moscow, and Alexandr Ivanovich Kolomeichuk, ulitsa Konenkova, 5, kv. 273, Moscow, all of U.S.S.R.

Continuation-in-part of Ser. No. 666,156, Mar. 11, 1976, abandoned. This application Feb. 9, 1977, Ser. No. 767,228

Claims priority, application U.S.S.R., Mar. 17, 1975, 2110221; May 6, 1975, 2131975

Int. Cl.[2] C25C *1/12, 1/06*

U.S. Cl. 204—151 **5 Claims**

1. A method of regeneration of a spent etching solution containing cupric chloride and a metal chloride selected from the group consisting of cuprous chloride and ferrous chloride, comprising subjecting said solution to electrolysis with copper being reduced at the cathode, and the metal chloride being oxidized at the anode with simultaneous liberation of chlorine which is used for additional oxidation of said metal chloride.

4,107,012

MONOMER-FREE RESIN COMPOSITIONS, BASED ON UNSATURATED POLYESTERS, WHICH CAN BE CURED BY UV-LIGHT

Karl Fuhr, Krefeld; Hans-Joachim Traenckner, Krefeld-Fischeln; Hans Jürgen Rosenkranz, Krefeld; Hans Rufolph, Krefeld-Bockum; Manfred Patheiger, Krefeld-Uerdingen, and Artur Haus, Overath, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Apr. 24, 1973, Ser. No. 354,104

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1972, 2221335

Int. Cl.[2] C08G *18/00, 63/00*

U.S. Cl. 204—159.19 **9 Claims**

1. A resin composition which is curable by ultraviolet light, said composition comprising

(a) as the sole curable component, 10 to 99.7% by weight of a polyester having a molecular weight of 300 to 4,000 and containing α,β-ethylenically unsaturated dicarboxylic acid radicals and β,γ-ethylenically unsaturated ether groupings, the molar ratio of the β,γ-unsaturated ether groupings to the double bonds of the dicarboxylic acid radicals being from 0.2:1 to 8:1 and (b) 0.3 to 10% by weight of a photoinitiator.

4,107,013
ULTRAVIOLET CURABLE LATEXES

Vincent Daniel McGinniss, Valley City; Robert Joseph Seidewand, Olmsted Falls, and James Robert Erickson, Brunswick, all of Ohio, assignors to SCM Corporation, New York, N.Y.

Filed Dec. 13, 1976, Ser. No. 749,883
Int. Cl.[2] C08F *8/00*
U.S. Cl. 204—159.16 **4 Claims**

1. An ultraviolet curable aqueous latex coating composition, comprising:

an aqueous latex mixture of a high molecular weight polymer and a low molecular weight cross-linking polymer wherein the mixture contains between 5% and 35% of said low molecular weight cross-linking polymer and between 1% and 5% of an ultraviolet sensitizer based on the combined weight of the cross-linking polymer and the high molecular weight polymer;

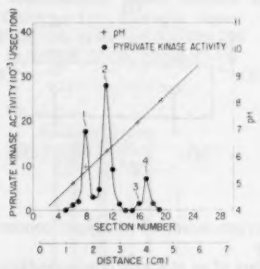
said high molecular weight polymer being a latex containing polymer particles having an average molecular weight greater than 100,000, said high molecular weight polymer particles comprising a core polymer of copolymerized ethylenically unsaturated monomers and a shell polymer portion of copolymerized difunctional monomers containing unreated allyl surface groups preferentially orientated on polymer particle surfaces;

said low molecular weight cross-linking polymer having a molecular weight between about 300 and 3,000 and containing ethylenically unsaturation for cross-linking with the allyl surface groups on said high molecular weight polymer particles upon exposure to ultraviolet energy.

4,107,014
ISOELECTRIC POINT MARKERS FOR GEL ISOELECTRIC SEPARATION

Yasuo Suzuki, Suita; Isamu Takagahara, Kawanishi; Tsuyoshi Fujita; Katsumi Fujii, both of Suita, and Takekazu Horio, Takatsuki, all of Japan, assignors to Oriental Yeast Co. Ltd., Japan

Filed Dec. 28, 1976, Ser. No. 754,976
Claims priority, application Japan, Jan. 30, 1976, 51/8388
Int. Cl.[2] G01N *27/26*
U.S. Cl. 204—180 R **6 Claims**

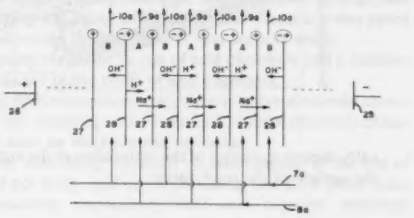


1. Isoelectric point markers for a gel isoelectric separation, which comprise at least two colored proteins of which the isoelectric point pHs are known, and wherein the difference between the highest value and the lowest value among said pHs is not less than 0.5.

4,107,015
METHOD FOR REMOVAL OF SO_2 FROM GASES

Frederick P. Chlanda, Rockaway; Krishnamurthy Nagasubramanian, Parsippany, and Kang-Jen Liu, Somerville, all of N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Jul. 18, 1977, Ser. No. 816,566
Int. Cl.[2] B01D *13/02*
U.S. Cl. 204—180 P **20 Claims**



1. Method for direct generation of SO_2 and a liquor which is capable of absorbing SO_2 from an aqueous SO_2-containing salt solution in which soluble sulfites and bisulfites are present which comprises:

(a) dividing said solution into two streams A and B;

(b) subjecting said streams to electrodialytic water splitting in a two-compartment water splitter comprised of alternating cation and a bipolar module consisting of a combination of anion and cation membranes functioning as a bipolar membrane, wherein one of said streams is introduced into the water splitter compartments between the cation membranes and the anion membranes of the bipolar membrane combination;

(c) introducing the other stream, A, into the compartments of said splitter between the cation sides of said bipolar module and the cation membranes;

(d) passing a direct current through the water splitter thereby effecting the acidification of the stream A and the basicification of the stream B and the transfer of cations from stream A to stream B and producing an aqueous solution comprised of SO_2 derived from stream A and a solution comprised of base capable of absorbing SO_2 derived from stream B.

4,107,016
METHOD AND APPARATUS FOR ELECTRO-PHORECTIC COATING

Loyd R. Brower, Jr., Olympia Fields; Leonard P. Madsen, St. Anne; Chesly L. Zutaut, Park Forest, and Walter M. Barden, Jr., Wheaton, all of Ill., assignors to Standard T. Chemical Company, Inc., Chicago, Ill.

Continuation of Ser. No. 686,110, Jun. 7, 1976, abandoned, which is a continuation-in-part of Ser. No. 597,314, Jul. 21, 1975, abandoned. This application Jun. 20, 1977, Ser. No. 807,965
Int. Cl.[2] C25D *13/14*
U.S. Cl. 204—181 R **17 Claims**

1. A method for electrophoretically coating a surface of an electrically conductive work piece having a selected linear dimension, comprising the steps of:

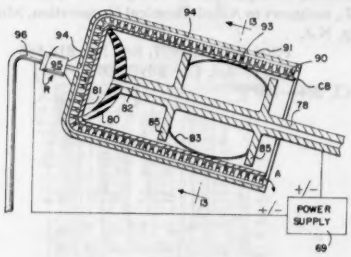
establishing said work piece at one electrical polarity,

flowing an electrophoretic coating material in a linear stream along the selected linear dimension of the work piece,

inducing an electrical charge of opposite polarity on the electrophoretic material and along the length of the linear stream thereof, whereby electrophoretic migration of the electrophoretic material to the work piece is effected, and

moving the work piece and the charged linear stream of electrophoretic material relative to one another about an

axis fixed relative to the linear stream and in a direction lateral to the linear dimension, thereby to electrophoretically deposit a coating of the material over the entirety of the surface of the work piece.

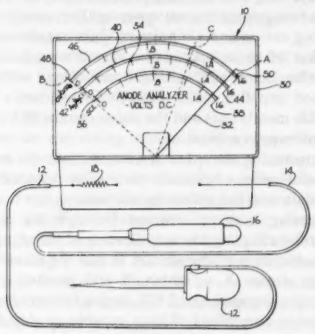


4,107,017

ANODE ANALYZER

Todd C. Sabins, El Cajon, Calif., assignor to Sabins Industries, Inc., Long Beach, Calif.

Filed Nov. 8, 1976, Ser. No. 740,116
Int. Cl.[2] G01N *27/46*; C23F *13/00*
U.S. Cl. 204—195 R **10 Claims**



1. An apparatus for evaluating the effectiveness of anodes in a cathodic protection system protecting a structure in an electrolyte from electrochemical corrosion, said apparatus comprising:

a voltmeter having a positive terminal and a negative terminal, said negative terminal being conductively connected to a reference half cell member and said positive terminal being conductively connected to said structure;

said reference half cell which is a probe immersed in said electrolyte and which is made of an alloy of magnesium known as AZ **63** which has an electrochemical reaction potential more negative than the structure protected by said cathodic protection system when positioned in said electrolyte;

said voltmeter having a plurality of scales thereon, and an indicator needle moveable across the plurality of scales in response to a potential difference appearing between said positive and negative terminals;

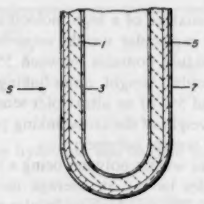
each of said plurality of scales having a sequence of numbers placed therealong and each scale being so placed beneath the indicator needle that when the indicator needle comes to rest the number beneath the indicator needle indicates the negative of the electrochemical potential of the structure with respect to the voltage of a standard reference half cell for which that scale is calibrated.

4,107,018

SOLID ELECTROLYTE GAS SENSOR HAVING A PROTECTIVE BONDING LAYER

James Daniel Bode, Royal Oak, and Seong Kwan Rhee, Livonia, both of Mich., assignors to Bendix Autolite Corporation, Fostoria, Ohio

Filed Sep. 1, 1977, Ser. No. 829,709
Int. Cl.[2] G01N *27/46*
U.S. Cl. 204—195 S **10 Claims**



1. In a solid electrolyte sensor element for sensing oxygen wherein the element comprises a solid electrolyte body for transferring oxygen ions, the body having an inner surface with conductive means thereon, the improvement comprising a nonreactive but compatible bonding layer of an oxide of an alkaline earth metal selected from the group consisting of magnesium and calcium or a mixture thereof, on the outer surface of said solid electrolyte body and a conductive catalyst layer superimposed on said bonding layer.

5. In a method of forming a solid electrolyte sensor element for sensing oxygen having a solid electrolyte body with an inner surface having a conductive means thereon, the improvement comprising:

applying to the outer surface of said solid electrolyte body a nonreactive but compatible layer of an oxide of an alkaline earth metal selected from the group consisting of magnesium and calcium oxide or a mixture thereof; and

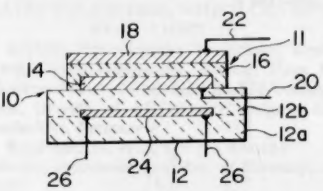
applying a conductive catalyst layer over said layer of oxide.

4,107,019

SOLID ELECTROLYTE THIN FILM OXYGEN SENSOR HAVING THIN FILM HEATER

Hiroshi Takao, Kamakura, and Kazuo Matoba, Yokosuka, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Oct. 13, 1977, Ser. No. 841,973
Claims priority, application Japan, Oct. 14, 1976, 51-122298
Int. Cl.[2] G01N *27/46*
U.S. Cl. 204—195 S **10 Claims**



1. An oxygen sensor of an oxygen concentration cell type, comprising:

a base plate of an electrically nonconductive material;

a thin layer laid on one side of said base plate, said thin layer being of a material which is composed of a metal and an oxide of said metal and serves as the source of a reference oxygen partial pressure;

a thin layer of an oxygen ion conductive solid electrolyte laid on the metal-oxide layer so as to entirely shield the metal-oxide layer from the atmosphere;

an electron conductive and gas permeable thin layer coated on the solid electrolyte layer; and

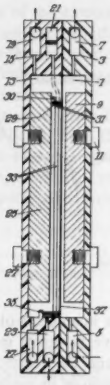
a thin metal layer which has a resistance suitable as a resistance heating element and is embedded in said base plate to lie generally parallel to the solid electrolyte layer.

4,107,020

VERTICAL ELECROLYTIC CELLS

Michel Brochier, Grenoble, and Maurice Pichon, Decines, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jan. 28, 1977, Ser. No. 763,633
Claims priority, application France, Jan. 30, 1976, 76 03017
Int. Cl.[2] C25B *11/18, 9/00, 1/38*
U.S. Cl. 204—251 **18 Claims**



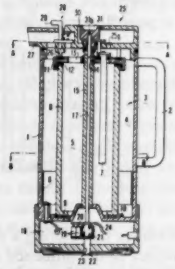
1. A vertical electrolytic cell having cathode means and anode means, wherein said cathode means comprises a substantially horizontal channel provided with a bottom wall having a plurality of apertures located above an unobstructed space, means for delivering mercury to said channel and means for collecting mercury flowing down by gravity from said apertures and directing said mercury out of said cell, the size of said apertures being such that mercury flows as continuous threads from said apertures throughout said space.

4,107,021

WATER POT WITH AN ELECTROLYZING DEVICE

Tatsuo Okazaki, Kamifukuoka, Japan, assignor to Okazaki Manufacturing Company Ltd., Kawagoe, Japan

Filed Nov. 24, 1976, Ser. No. 744,706
Int. Cl.[2] C25B *11/00, 13/00, 15/00*
U.S. Cl. 204—263 **31 Claims**



1. A water pot with an electrolyzing device comprising a pot body having an opening at the top thereof to receive water to be electrolyzed, and a handle,

said pot body including:

an electrolyzing vessel, said vessel having support areas for supporting a partition therein;

a removable hollow, porous partition member which is mountable on said support areas of said vessel for dividing said vessel into two chambers, said hollow porous partition member being insertable into said vessel through said opening and being mountable in said vessel in water proof relationship to said vessel at said support areas;

a negative electrode in one of said chambers and a positive electrode in the other of said chambers;

means in communication with the positive electrode chamber for removing water from said positive electrode chamber after an electrolyzing operation;

a cover detachably mounted on said opening at the top of said pot body, said cover including two flow paths communicating respectively with said negative electrode chamber and said positive electrode chamber;

a nozzle in said pot body which is in communication with said negative electrode chamber; and

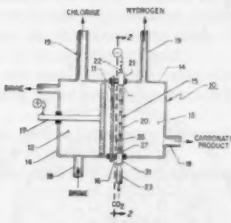
said means for removing water from said positive electrode chamber comprising a three way valve for selectively communicating said two flow paths with said nozzle.

4,107,022

WAFER ELECTRODE FOR AN ELECTROLYTIC CELL

Thomas G. Strempel, Madison, and Charles J. Hora, Willoughby Hills, both of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Division of Ser. No. 622,702, Oct. 15, 1975, Pat. No. 4,033,848.
This application Apr. 29, 1977, Ser. No. 792,449
Int. Cl.[2] C25B *11/02*
U.S. Cl. 204—265 **6 Claims**



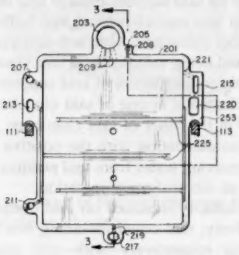
1. An electrolytic cell comprising: two half-cell members; a hydraulically impermeable cation exchange membrane in contact with one of said half-cell members; at least one wafer electrode comprising two annular flanges having an inner circumferential edge and connected by a sealing engagement at an outer peripheral edge thereof, a foraminous electrode plate retained between said annular flanges by weldment at the outer peripheral edge of said annular flanges, and at least one access tube extending substantially in the same plane as said electrode plate from said outer peripheral edge to said inner circumferential edge through said annular flanges so as to define a passage way therebetween; and means for spacing said membrane from said at least one wafer electrode, said other half-cell member being in contact with said at least one wafer electrode so as to form a closed electrolytic cell having an anode compartment and a cathode compartment.

4,107,023

FILTER PRESS HALATE CELL

Bernardus J. Mentz, Pitt Meadows, Canada, assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Jul. 9, 1976, Ser. No. 703,721
Int. Cl.[2] C25B *1/14, 1/26, 9/00, 9/02*
U.S. Cl. 204—269 **20 Claims**



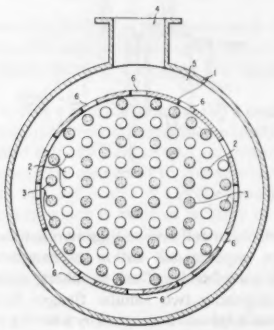
1. A diaphragmless electrolysis cell for the manufacture of metal halates comprising in combination a plurality of electrode units, each electrode unit having a single frame member, an anode and cathode mounted to opposing sides of the frame member in spaced relationship with each other, means for maintaining each electrode unit uniformly spaced from adjacent electrode units, means for holding the electrode units together to effect a series cell arrangement, means for electrically connecting the electrode units, inlet means for feeding electrolyte to the cell, and outlet means for removing cell liquor and gaseous material from the cell.

4,107,024

ELECTROLYTIC CELL WITH ELECTRODES ARRANGED AS A HEXAGON

Toshio Fukuzuka; Kazutoshi Shimogori, both of Kobe, and Hiroshi Satoh, Suita, all of Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Filed May 18, 1977, Ser. No. 797,880
Claims priority, application Japan, May 18, 1976, 51-57517
Int. Cl.[2] C25B *9/00*
U.S. Cl. 204—275 **8 Claims**



1. An electrolytic cell for treatment of an electrolytic solution comprising a plurality of spaced apart and parallel monopolar bar type electrodes with clearances defined between said electrodes for receiving said electrolytic solution;

a cathode terminal and an anode terminal disposed at opposite ends of said electrodes;

at least one polar group of said electrodes arranged in said electrolytic cell so that one electrode is located at the center of an equilateral hexagon and other electrodes are located at apexes of said hexagon;

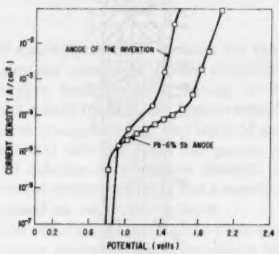
said plurality of monopolar bar type electrodes including a plurality of cathodic bar type electrodes and a plurality of anodic bar type electrodes wherein the ratio of the total number of cathodic bar type electrodes most adjacent to respective anodic bar type electrodes to the total number of the anodic bar type electrodes is at least 2.

4,107,025

STABLE ELECTRODE FOR ELECTROCHEMICAL APPLICATIONS

Raouf O. Loutfy, Pierrefonds, and Paul P. K. Ho, Ile Bizard, both of Canada, assignors to Noranda Mines Limited, Toronto, Canada

Filed Nov. 9, 1977, Ser. No. 850,043
Int. Cl.[2] C25B *11/08*
U.S. Cl. 204—290 F **9 Claims**



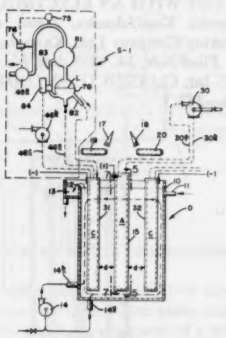
1. An electrode for use in an electrolytic process comprising an electrically conductive substrate made of a material resistant to the electrolyte and the electrolytic products thereof, coated on at least a portion of its surface with a basic coating of a material containing 30–70% by weight of an acid insoluble metal tungstate, 15–60% by weight Ta_2O_5 and 5–15% by weight of a noble metal oxide.

4,107,026

SYSTEM AND METHOD FOR ELECTRIC DEWATERING OF SOLIDS SUSPENSION

Mark P. Freeman, Darien, Conn., assignor to Dorr-Oliver Incorporated, Stamford, Conn.

Filed Jun. 17, 1976, Ser. No. 697,142
Int. Cl.[2] B01D *13/02*
U.S. Cl. 204—300 R **43 Claims**



1. A treatment system for dewatering a suspension of solids in a carrier liquid, subject to the influence of an electric field, which comprises,

a treatment tank,

feed means for supplying a flow of said suspension to the

tank, with means for containing therein a body of the suspension of a predetermined depth,

a pair of self-contained mutually opposed electrode structures positioned in said tank as a cathodic electrode and as an anodic electrode having between them a controllable electric field, while submerged in said body suspension of said depth,

one of said electrode structures being adapted for the formation thereon of a layer of suspension solids under the influence of said electric field, the second of said electrode structures comprising a hollow body having a liquid pervious wall representing a filtration area opposite to said electrode surface of the one electrode structure, and adapted for the passage therethrough of a flow of carrier liquid as filtrate separated from solids migrating in the opposite direction towards said one electrode structure under the influence of the electric field,

a vacuum supply connected to the hollow body of said second electrode structure, adapted to provide a pressure differential for effecting passage of said carrier liquid through said filtration area,

pumping means effective separate from the vacuum supply for drawing filtrate liquid from the said hollow electrode structure at a controlled rate against the vacuum,

and actuating means operable for removing and recovering said layer of suspension solids from said electrode surface.

4,107,027

DEVICE FOR CONTINUOUS ELECTROPHORESIS IN A CARRIER FREE BUFFER CURRENT

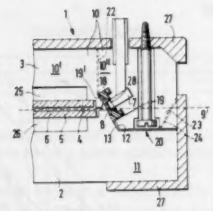
Helmüt Muckenmuller, Dossenheim, and Hubert Muth, Mauer, both of Fed. Rep. of Germany, assignors to C. Desaga GmbH, Nachf. Erich Fecht, Heidelberg, Fed. Rep. of Germany

Filed Mar. 15, 1977, Ser. No. 777,669

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1976, 2612005

Int. Cl.² G01N *27/26, 27/28*

U.S. Cl. 204—301 **13 Claims**



1. Device for continuous electrophoresis in a carrier free buffer current, said device comprising a separating chamber including a two-part frame, two plane parallel glass plates positioned in said frame, said glass plates defining a separating space therebetween, electrode chambers disposed in said frame and coacting with said separating space, permeable membranes separating said electrode chambers from said separating space, said frame having a dividing plane parallel to said glass plates, first surfaces of one frame part facing second surfaces of the other frame part to define a dividing joint between the two frame parts, said dividing joint being at least partially disposed at an angle to said dividing plane, and means for maintaining said membranes in said dividing joint to press said membranes against at least one of said first and second surfaces when said two frame parts are joined together for providing a seal which is effected by said angle.

4,107,028

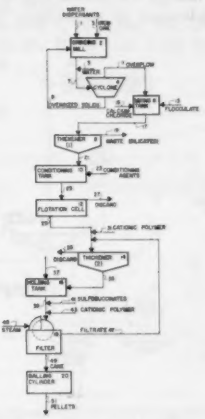
TREATMENT OF IRON CONCENTRATE SLURRY TO IMPROVE FILTRATION

Robert C. Emmett, Jr.; Stanley D. Heden, and Roger P. Summerhays, all of Salt Lake City, Utah, assignors to Envirotech Corporation, Menlo Park, Calif.

Filed Jan. 27, 1977, Ser. No. 763,264

Int. Cl.² B03B *9/00*

U.S. Cl. 209—5 **7 Claims**



1. In a process for concentration of iron ores comprising the following sequence of steps: (1) initially forming a relatively stable alkaline aqueous dispersion of the ore; (2) treating the dispersion of ore with a flocculating agent capable of causing selective flocculation of the iron oxides in the ore in preference to silica materials; (3) allowing the flocculated iron oxides to settle; (4) separating and removing the suspended silica materials from the flocculated iron oxides; (5) subsequently subjecting an aqueous pulp of the flocculated iron oxides to a froth flotation operation in the presence of a collector to further separate iron oxides from siliceous materials; and (6) thickening the underflow of the froth flotation operation to dewater the iron oxide slurry the improvement comprising:

a. neutralizing the thickened iron oxide slurry to a pH of about 6 to 8.5 by addition of acid;

b. adding to the neutralized iron oxide slurry a surface tension reducing agent consisting essentially of sulfosuccinates;

c. filtering to form a cake from the neutralized and agent containing iron oxide slurry; and

d. dewatering the cake in a steam environment.

4,107,029

DUAL CONTROL SYSTEM FOR TAILINGS OUTLET OF PRIMARY SEPARATION VESSEL IN THE HOT WATER PROCESS FOR BITUMINUOUS SANDS

Gordon Ronald Lorenz, Edmonton, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of Energy, Mines and Resources, Ottawa; Her Majesty the Queen in right of the Province of Alberta, Government of the Province of Alberta, Department of Energy and Natural Resources, Alberta Syncrude Equity, Edmonton; Ontario Energy Corporation; Imperial Oil Limited, both of Toronto; Canada-Cities Service, Ltd., Calgary and Gulf Oil Canada Limited, Toronto, all of, Canada

Filed Jan. 25, 1977, Ser. No. 762,776

Claims priority, application Canada, Apr. 27, 1976, 251142

Int. Cl.² C10G *1/04*

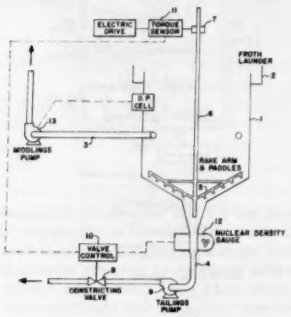
U.S. Cl. 208—11 LE **1 Claim**

1. In the hot water process for recovering bitumen from bituminous sands which vary in fine solids content, wherein an

aqueous slurry of the sands is fed to a primary separation vessel, said vessel having a sand rake rotated by a shaft and a tailings outlet controlled by throttling means, said vessel producing a bitumen froth stream, a tailings stream mainly comprising solids, and a middlings stream,

the improvement comprising:

when the slurry feed to the vessel is formed from bituminous sands containing less than 15 - 20% by weight of the total solids as fine solids, controlling the throttling means to increase the tailings withdrawal rate in response to measurements indicative of an increase in the rake shaft torque; and



when the slurry feed to the vessel is formed from bituminous sands containing more than 15 - 20% by weight of the total solids as fine solids, controlling the throttling means to increase the tailings withdrawal rate in response to measurements indicative of an increase in the density of the tailings stream,

so that the tailings level within the vessel can be accurately monitored and the information acquired used to control the rate of withdrawal of the tailings to thereby optimize the composition of the tailings stream and stabilize the operation of the vessel.

4,107,030

ANTIFOULANTS FOR CRUDE OIL

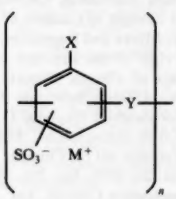
Manuel Slovinsky, and Dodd Wing Fong, both of Woodridge, Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Continuation-in-part of Ser. No. 692,554, Jun. 3, 1976, abandoned, which is a continuation of Ser. No. 550,874, Feb. 19, 1975, abandoned, which is a division of Ser. No. 491,011, Jul. 23, 1974, abandoned. This application Feb. 17, 1977, Ser. No. 769,747

Int. Cl.[2] C10G *9/16*

U.S. Cl. 208—48 AA **7 Claims**

1. A method of preventing fouling on high temperature metal surfaces of oil heat exchangers by utilization at the metal surface an antifouling amount of a compound selected from the following formula:



X = NH_2, NHR, $NHCH_2CHOHR$ (R = straight or branched chain alkyl containing 2 to 20, preferably 6 to 16, carbon atoms)

Y = H, CH_2

M = ammonia, amine containing 1–54 carbons where the total number of carbon atoms in X and M is ≧ 8 but ≦ 54

n ≧ 1.

4,107,031

HYDROCRACKING PROCESS WITH REACTIVATED CATALYST

John W. Ward, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Sep. 16, 1976, Ser. No. 723,816

The portion of the term of this patent subsequent to Jan. 11, 1994, has been disclaimed.

Int. Cl.[2] C10G *13/02;* B01J *29/12*

U.S. Cl. 208—111 **14 Claims**

1. A hydrocracking process which comprises subjecting a hydrocarbon feedstock plus added hydrogen to contact at hydrocracking conditions of temperature, pressure and space velocity with a catalyst comprising a Group VIII noble metal supported on a stabilized Y zeolite cracking base, said catalyst having been previously utilized for hydrocracking to a point of substantial deactivation, and having thereafter been reactivated by a process which comprises:

(1) subjecting said deactivated catalyst to oxidative combustion to remove coke deposits therefrom;

(2) contacting the decoked catalyst from step (1) with aqueous ammonia containing at least 0.1 wt.% NH_3 for a sufficient time to effect a redispersal of said Group VIII noble metal; and

(3) drying and calcining the ammoniated catalyst from step (2) in an oxidizing gas at a maximum temperature of about 600°–850° F, to effect deammoniation of said catalyst and to reduce its water content to between about 4% and 12% by weight, the temperature and water vapor partial pressures during said drying and calcining being controlled for the purpose of preventing reagglomeration of said Group VIII noble metal.

4,107,032

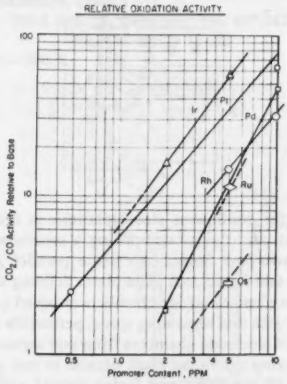
PROCESS FOR CRACKING HYDROCARBONS

Arthur Warren Chester, Cherry Hill Township, Camden County, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 1, 1976, Ser. No. 737,633

Int. Cl.[2] B01J *8/24, 27/10;* C10G *23/04*

U.S. Cl. 208—120 **17 Claims**



1. In a fluid cracking process for cracking a hydrocarbon feed in the absence of added hydrogen, said process comprising continuously circulating an inventory of zeolitic cracking catalyst between a cracking zone wherein the temperature is higher than 800° F and a regeneration zone wherein the temperature is higher than about 1000° F, contacting said hydrocarbon feed with said zeolitic cracking catalyst in said cracking

zone thereby forming cracked products and coked catalyst, separating and passing said coked catalyst to said regeneration zone while feeding an oxygen containing regeneration gas to said regeneration zone thereby regenerating said coked catalyst and producing a flue gas with a CO_2/CO ratio of less than about 2.0, and returning said regenerated catalyst to said cracking zone, the improvement whereby the CO_2/CO ratio is increased to a predetermined value thereby forming a flue gas of reduced carbon monoxide content, which comprises:

including in said circulating inventory of zeolitic cracking catalyst combustion-promoter metal selected from the group consisting of platinum, palladium, rhodium, ruthenium, iridium, osmium and rhenium, in an amount that does not exceed 100 parts per million and that is insufficient to produce a CO_2/CO ratio of said predetermined value;

and, contacting said circulating inventory of metal-promoted catalyst with an amount of elemental chlorine, elemental bromine, a metal-free chlorine compound, or a metal-free bromine compound effective to increase said CO_2/CO ratio to said predetermined value.

4,107,033

APPARATUS FOR CLEANING FIBROUS SUSPENSIONS OF LOW STOCK CONSISTENCY

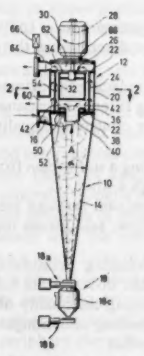
Emil Holz, Eningen/u.A., Fed. Rep. of Germany, assignor to Hermann Finckh Maschinenfabrik, Fed. Rep. of Germany

Filed Mar. 14, 1977, Ser. No. 777,065

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1976, 2611885

Int. Cl.[2] B04C *9/00*

U.S. Cl. 209—17 **10 Claims**



1. In an apparatus particularly suited for cleaning and sorting fibrous suspensions having a low stock consistency, the combination comprising:

a vortex cleaner having a downwardly tapering conical housing with an inlet for the suspension to be cleaned at the upper end and an outlet for the dirt particles removed at the lower end;

a pressure screen mounted to the upper end of the vortex cleaner housing, said pressure screen having a stationary and cylindric upright screen basket, a driven rotor within said screen basket, the axes of the screen basket and of the rotor being concentric with said vortex cleaner housing, said rotor having a lower surface with a central opening therein and means to promote the circulation of the suspension flowing into the vortex cleaner, said rotor forming an annular clearance with said screen basket and sealing means for closing the annular clearance between the rotor and the screen basket such that substantially none of said suspension entering said vortex cleaner passes upwardly between said screen basket and said rotor and substantially all of the cleaned suspension leaving said vortex cleaner passes upwardly through the central opening in said lower rotor surface, said central opening comprising means for delivering said cleaned suspension leaving said vortex cleaner to said annular clearance.

4,107,034

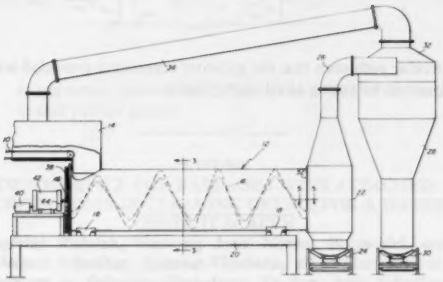
AIR SCREW CLASSIFIER

Malcolm M. Paterson, Lee, N.H.; Michael R. Grubbs, Houston, Tex.; Peter J. Cambourelis, Lexington, Mass., and Vernon L. Schrimper, Cedar Rapids, Iowa, assignors to Raytheon Company, Lexington, Mass.

Filed Oct. 1, 1976, Ser. No. 728,686

Int. Cl.[2] B07B *1/20, 1/22, 9/02*

U.S. Cl. 209—135 **5 Claims**



1. An air drum classifier for separating mixed solid materials into heavy and light materials, comprising an elongated drum having an inlet end and a discharge end spaced therefrom, a rotary feed screw extending axially within the drum, said screw being comprised of an arrangement of spiral ribbon flights providing an unobstructed opening extending throughout its axis, means for rotating said screw, the drum having an opening adjacent its inlet end whereby a mixture of solid materials may be deposited within the screw so as to be moved toward the discharge end by the screw, means for directing a stream of air longitudinally through the drum and axially through the screw for entraining light materials from said mixture and carrying them out of the drum through said discharge end while heavy materials move progressively along the drum and out said discharge end separately from the light materials, said feed screw being supported at one end by a ring gear which is rotatably mounted on the inlet end of the drum and rotatable with respect thereto, said one end of the feed screw being operatively connected to said gear.

4,107,035

THREE-PLANE BALANCE GYRO SIFTER

James Daniel Foresman, Hughesville, Pa., assignor to The Young Industries, Inc., Muncy, Pa.

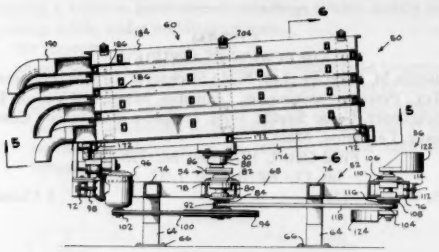
Filed May 2, 1977, Ser. No. 793,196

Int. Cl.[2] B07B *1/44*

U.S. Cl. 209—309 **17 Claims**

16. A method for balancing a gyratory screener having a base, a sieve box, a linear bearing mounted on the base for supporting the sieve box at an outlet end of the sieve box, an eccentric drive means with an axis of rotation relative to the screen assembly and spaced apart from the linear bearing for causing a portion of the sieve box to move on a circular path, and a balancing shaft rotatably mountable on said base with the axis of rotation of said balancing shaft being generally parallel to the axis of rotation of said circular path, said method comprising positioning the axis of rotation of the circular path to pass through the center of gravity of the screen assembly, providing a means for rotating the balancing shaft and the eccentric drive means at the same rate of rotation, and selecting the weight of a first eccentric balance weight to be mounted on said shaft, the vertical position and eccentric

position of said first weight and the distance of the axis of rotation of the balancing shaft from the axis of rotation of the



circular path such that the gyratory screener is provided with dynamic balancing in all three planes.

4,107,036

SEPARATION OF CARBON BLACK BY LIQUID HYDROCARBONS

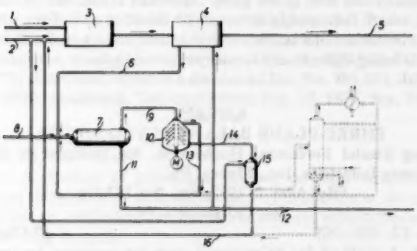
Heinz Giesen; Josef Hibbel; Willi Jansen, and Sebastian Speth, all of Oberhausen, Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen, Germany

Continuation of Ser. No. 602,237, Aug. 6, 1975, abandoned. This application Jul. 29, 1977, Ser. No. 820,349

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1974, 2440472

Int. Cl.[2] B01D *11/04*

U.S. Cl. 210—21 **5 Claims**



1. A process for separating carbon black from a liquid containing it comprising

a. adding 20 to 100 parts of a liquid hydrocarbon per part of carbon black to said liquid to form a first mixture and whereby said carbon black passes into the hydrocarbon phase,

b. passing said first mixture into a settling zone,

c. separating said hydrocarbon and carbon black from said liquid by the method comprising

1. permitting said hydrocarbon and carbon black to form a layer upon the surface of said liquid,

d. passing said layer through a disk centrifuge having a plurality of conical disks.

4,107,037

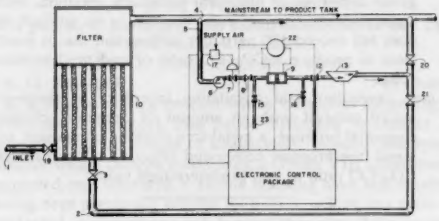
METHOD AND APPARATUS FOR AUTOMATIC CONTROL OF FILTRATE QUALITY

Robert J. Cavanaugh, Ponca City; Robert L. Coffee, Newkirk; Dell Conley, and Howard H. Ferrell, both of Ponca City, all of Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Sep. 28, 1977, Ser. No. 837,117

Int. Cl.[2] B01D *23/24*

U.S. Cl. 210—82 **14 Claims**



1. A method for determining filtered quality of a fluid stream which has passed through a primary filter the method comprising

(a) removing a sidestream of liquid which has passed through said filter,

(b) passing said sidestream through a means capable of maintaining constant flow,

(c) passing the stream from said constant flow means through a monitoring backwashable filter of appropriate pore size,

(d) determining the pressure drop (ΔP) over the monitoring filter, and thereby determining the quality of said filter stream,

(e) regenerating or replacing the primary filter when the ΔP for the monitoring filter reaches unacceptable levels

10. An apparatus for controlling quality of a primary filter filtrate comprising

(1) means for removing a sidestream from said filtrate, which has passed through a filter,

(2) passing said sidestream through means capable of maintaining constant flow, said means forcing said sidestream through,

(3) means for determining pressure drop (ΔP) from the upstream side to the downstream side of said monitoring filter, and determining the quality of said filtrate,

(4) means for backwashing said monitoring filter, said means being employed either

(a) at predetermined time independent of P or

(b) when ΔP reaches a predetermined value or

(c) when the flow downstream of said monitoring filter falls below a predetermined value at controlled upstream pressure and

(5) means for stopping flow through said primary filter when ΔP of 4 begins the monitor filter backwash.

4,107,038

METHOD AND APPARATUS FOR REMOVING GRIT

Frank George Weis, Kansas City, Mo., assignor to Ecodyne Corporation, Lincolnshire, Ill.

Filed Aug. 12, 1977, Ser. No. 824,183

Int. Cl.[2] B03B *5/48*

U.S. Cl. 210—84 **11 Claims**

1. Apparatus for separating grit from liquid sewage while retaining organic solids therein, comprising:

(a) a circular settling chamber;

(b) a grit storage chamber disposed immediately below said settling chamber;

(c) a transition surface separating said settling chamber and said storage chamber, said transition surface having a

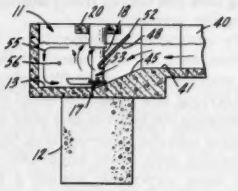
centrally disposed opening therethrough permitting communication between said settling chamber and said storage chamber;

(d) a multi-bladed propeller mounted for rotation in a predetermined direction about a vertical axis centered in said opening, said blades being adjustable as to height above said transition surface, pitch, and speed of rotation;

(e) an inlet trough having flume portion with one edge which intersects the upper portion of said settling chamber essentially tangentially thereto for flowing a tangential stream of liquid sewage into said settling chamber;

(f) a ramp extending downwardly from the intersecting edge of said flume portion to said transition surface at an acute angle with said transition surface for guiding grit to said transition surface;

(g) a baffle extending into said settling chamber adjacent to said flume potion at essentially a right angle to said edge of said flume portion which is tangential to said settling



chamber, said baffle being at least as wide as said flume portion and having an upper portion extending above the surface of the liquid in said settling chamber, the lower edge of said baffle being spaced above said transition surface at an acute angle with said transition surface, said upper portion of said baffle being closer to said edge of said flume portion than said lower edge of said baffle, said baffle being positioned so that liquid moved by said propeller and all liquid entering said settling chamber through said flume portion impinges against said baffle and is deflected into a generally toroidal flow pattern moving in said predetermined direction of propeller rotation around said settling chamber with the centroid of such toroidal flow pattern being a circle lying in a horizontal plane and being concentric with said settling chamber; and

(h) outlet means for removing grit-free liquid and organic solids from an upper portion of said settling chamber along the outer periphery thereof.

4,107,039

DIALYSATE PREPARATION SYSTEM

Edward R. Lindsay, Jr., Clearwater, and Stephen Mason Meginniss, III, St. Petersburg, both of Fla., assignors to Extracorporeal Medical Systems, Inc., Pinellas Park, Fla.

Filed Apr. 7, 1976, Ser. No. 674,621
Int. Cl.[2] B01D *31/00*
U.S. Cl. 210—90 **12 Claims**

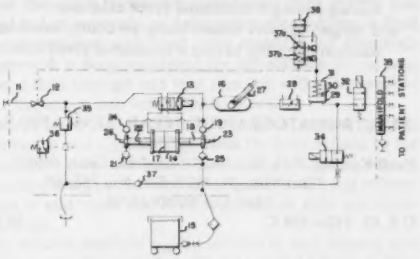
1. A central system for continuously preparing dialysate for a plurality of dialysis patient stations comprising:

a source of water under pressure,

a proportioning pump for mixing said water under pressure with concentrate to form dialysate under pressure,

a regulator valve connected between said source of water and said proportioning pump, and

volume sensing means connected between said proportioning pump and said patient station, said volume sensing means being connected to said regulator valve to control the pressure of the dialysate supplied to said patient station



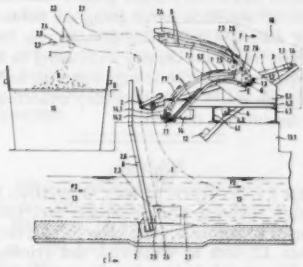
at a constant pressure for different flow rates of dialysate to said patient station.

4,107,040

DRIVE DEVICE FOR RAKE ARM WITH ATTACHED SCREEN COMB IN CLEANING DEVICE FOR A WATER CONDUIT SCREEN

Siegfried Rudolph, Hanover; Josef Nöring, Burgwedel, and August Schreiber, Hanover-Vinnhorst, all of Germany, assignors to Schreiber-Klaranlagen Dr.-Ing. Aug. Schreiber GmbH & Co. KG, Langenhagen, Germany

Filed May 24, 1977, Ser. No. 799,920
Int. Cl.[2] B01D *33/00, 35/16*
U.S. Cl. 210—159 **22 Claims**



1. In a device for cleaning a screen located in a water conduit wherein the device includes a screen rake having an arm and a screen comb at one end thereof, the rake being mounted to be moved from an intermediate position above the water level in the conduit, to a position in engagement with the screen, to a position above a collecting bin where the screen comb is tilted about a horizontal axis to dump its carried screenings, and wherein the rake arm is mounted for pivoting about a horizontal pivot axis and wherein a drive device is connected to said rake arm for pivoting said arm and moving said arm in a vertical plane downstream of the screen;

the improvement wherein the drive device includes

a continuous chain,

stationarily mounted deflection chain wheels over which said continuous chain is mounted to run,

a stationary curved guide path means positioned entirely above and outside of said conduit and between said deflection chain wheels over which said continuous chain runs; and

the additional improvement wherein

the rake arm comprises a two-armed lever which has a pivot axle connected to said continuous chain for movement thereof,

the rake arm being connected at the end thereof opposite the end attached to the screen comb adjacent one end of a hinged support means, said connection including a swing bearing having a horizontal pivot axle, and

said hinged support means being pivotably mounted on a stationary bearing having a horizontal pivot axle.

4,107,041

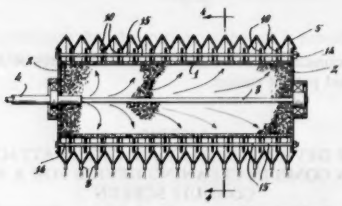
ELECTROMATOGRAPHIC SEPARATING APPARATUS AND SYSTEM

Eskil Karlson, P.O. Box 9000, Stamford, Conn. 06902

Filed Mar. 31, 1977, Ser. No. 783,208

Int. Cl.[2] B01D *15/08*

U.S. Cl. 210—198 C **10 Claims**



1. A continuous chromatographic column, the column having a length larger than its cross-sectional diameter, in which the column is packed with suitable chromatographic packing, means for introducing the materials to be separated under pressure at one end, means for spinning the column about an axis substantially central to the column at a rate such that the centrifugal force over the relatively short path at right angles to the column axis is very much greater than rate at which materials to be separated move along the column, whereby removal of materials at different points along the column is relatively very rapid, the column walls along its length being provided with means for permitting materials to be separated to pass through readily, and stationary collecting means for receiving the different fractions.

4,107,042

FILTER PRESS WITH SPRAY WASHING MEANS

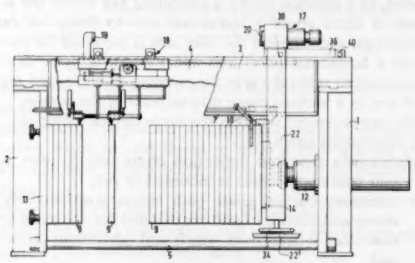
Hans Jüergen Heinrich, Wilhelmshoeher Str., 129, Ennepetal; Karl August Rademacher, Hatzfelder Str. 33; Helmut Strohn, Helmutstr. 12, both of Wuppertal, and Friedhelm Kramer, Unterm Hunnebrink 1, Attendorn-Neuenhof, all of Fed. Rep. of Germany

Filed Jun. 14, 1977, Ser. No. 806,331

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1976, 2627578

Int. Cl.[2] B01D *25/12;* **B08B** *3/02*

U.S. Cl. 210—225 **3 Claims**



1. A spray washing means for washing opposite sides of a filter plate having bores for filtering and for back washing when said plate is taken from a stack of filter plates mounted in a filter press, said means being adapted for washing the plate after filtering, comprising:

a spray pipe formed with a single inlet portion and a loop portion formed of two branched lines which are adapted to enclose a selected filter plate between said two branched lines;

nozzles in said loop portion in each of said two branched lines which face each other for simultaneous spraying opposite lateral surfaces of said filter plate under the same spraying pressure during spray washing by said pipe with water;

a carrier frame including generally vertical struts on which said spray pipe is mounted, said carrier frame being shiftable in a horizontal direction along the stack of plates in the filter press;

guides mounted on said vertical struts for guiding the vertical movement of said spray pipe;

said carrier frame further including a receiving tank at the underside of said carrier frame for collecting the spray water from said nozzles;

said receiving tank and carrier frame together being formed as a rectangular support;

a substantially vertical baffle suspended in a balanced relationship from each of said branched lines which is in alignment with the bores of the filter plate being washed, said baffle serving as a protective sheet to block washing liquid penetrating the bores of said plate and directing the blocked liquid into the receiving tank; and

said baffles having their lower edges curved toward each other and being swivelable toward a horizontal plane when in abuting relation to the receiving tank.

3. A filter press comprising:

vertical end posts;

horizontal I-guide carriers;

a stack of shiftable filter plates and a shiftable spray washing means carried by said horizontal I-guide carriers;

said spray means being adapted to simultaneously wash opposite sides of a filter plate which is taken from the stack by successively shifting the filter plates along said I-guide carriers;

said filter plates and said spray washing means being suspended from said horizontal I-guide carriers;

said spray washing means having a generally rectangular frame surrounding said I-guide carriers and said stack of filter plates for shiftable movement on the upper side of said I-guide carriers,

said spray washing means having a spray pipe;

said spray pipe being formed with an inlet portion and a generally horizontal loop portion formed of two branched lines which are adapted to enclose a selected filter plate between said two branched lines;

nozzles in said loop portion in each of said two branched lines which face each other for simultaneously spraying opposite lateral surfaces of said filter plate under the same spraying pressure during spray washing by said pipe with water;

said frame including generally vertical struts on which said spray pipe is mounted for guided vertical movement into a position beneath the underside of the stack; and

the base part of said rectangular frame forming a receiving tank collecting water dropping from the opposite sides of the filter plate during spray washing.

4,107,043

INLET CONDUIT FLUID FILTER

James C. McKinney, Atlanta, Ga., assignor to Creative Dispensing Systems, Inc., Atlanta, Ga.

Filed Mar. 3, 1977, Ser. No. 774,147

Int. Cl.[2] B01D *25/00, 25/18*

U.S. Cl. 210—232 **5 Claims**

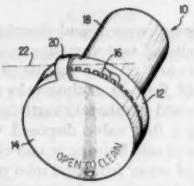
1. An article of manufacture for providing a fluid filter for an inlet conduit of a spray dispenser comprising a molded member having:

an annular plate portion;

a tubular portion in communication with a central opening in said annular plate portion, for engaging an end of the inlet conduit;

a generally circular plate portion, at least one of the surfaces of said plate portions having radially extending ribs for providing a plurality of fluid passages between said plates when the surfaces are located adjacent one another;

a flexible hinge portion connecting an area on the circumference of said circular plate portion to an area on the outer circumference of said annular plate portion; and,



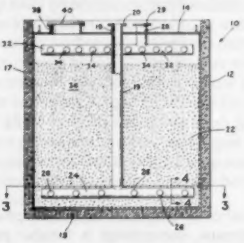
means for maintaining a surface of said circular plate portion adjacent a surface of said annular plate portion, including a male member attached to said generally circular plate portion, comprising a plurality of radially extending, resilient members with channels therebetween, wherein said male member is adapted for insertion into said tubular portion to pressurely engage an inner wall of said tubular portion and wherein the channels in said male member are adapted to communicate between the inlet conduit and the plurality of fluid passages between said plate portions.

4,107,044

METHOD OF AND APPARATUS FOR PURIFYING FLUIDS WITH RADIOACTIVE IMPURITIES

Jospeh A. Levendusky, Bayonne, N.J., assignor to Epicor, Inc., Linden, N.J.

Filed Aug. 25, 1976, Ser. No. 717,583
Int. Cl.² G21F *9/04*
U.S. Cl. 210—266 **7 Claims**



1. A disposable filter apparatus for the removal of radioactive dissolved and undissolved solids from a fluid, the filter apparatus comprising:

(a) a fluid tight vessel, said fluid tight vessel including a wall having an upper wall portion and a lower wall portion, said fluid tight vessel defining a chamber containing a bed of demineralization materials for removing said dissolved solids from said fluid;

(b) an inlet pipe extending through a first opening formed in said upper wall portion, the joint defined by the external surface of said inlet pipe and said first opening being closed such as to rigidly secure said inlet pipe to said vessel and to establish a fluid type seal therebetween;

(c) an inlet manifold rigidly secured to said inlet pipe within said chamber, said inlet manifold being in fluid communication with said inlet pipe;

(d) dispersion means rigidly secured to said inlet manifold, said dispersion means for introducing fluid evenly into said bed of materials, said dispersion means being in fluid communication with said inlet manifold to cooperate therewith in accommodating the introduction of contaminated fluid through said inlet pipe and said inlet manifold for dispersion into said bed of material

(e) an effluent pipe extending through a second opening formed in said upper wall portion, the joint defined by the external surface of said effluent pipe and said second opening being closed such as to rigidly secure said effluent pipe to said vessel and to establish a fluid tight seal therebetween;

(f) an effluent manifold rigidly secured to said effluent pipe within said chamber, said effluent manifold being in fluid communication with said effluent pipe, and said effluent manifold being positioned within said chamber, adjacent said lower wall portion;

(g) at least one drain line rigidly secured to and in fluid communication with said effluent manifold, each said drain line comprising a pipe having a plurality of openings therethrough to place the interior of said pipe in fluid communication with said bed of demineralization materials;

(h) filter means disposed on at least one of said dispersion means and said drain line for removing said undissolved solids from said fluid; and

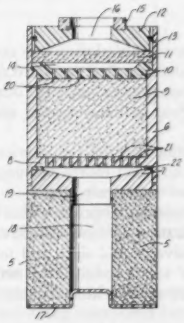
(i) a shielding means disposed around the outer surface of said vessel, said shielding means capable of precluding the emission of radiation from said vessel to the surrounding environs, and said shielding means defining a casing for said fluid tight vessel whereby, upon exhaustion of said demineralization materials and means for removing undissolved solids from said fluid, the entire structure may be removed to an authorized dumping site and buried thereby precluding the necessity for removing said exhausted, highly radioactive means and materials for removing said dissolved and undissolved solids from said filter apparatus.

4,107,045

FILTER-PURIFIER CARTRIDGE

Isadore Turetsky, 23940 Welby Way, Los Angeles, Calif. 91307

Filed Apr. 25, 1977, Ser. No. 790,844
Int. Cl.² B01D *23/06, 27/02*
U.S. Cl. 210—266 **3 Claims**



1. A filter-purifier cartridge for fluids, having a separable self contained cylindrical vessel containing granular purifying media supported by a perforated bottom within said vessel, the cylindrical wall section of said vessel extending beyond said perforated bottom; a perforated disk having an offset rimmed section inserted in an internally recessed upper section of said

cylindrical vessel and enclosing the granular purifying media within said vessel; a permeable porous disk resting against the offset rimmed section of the previously inserted perforated disk, a sealing ring resting against said permeable porous disk; a frictional seal disposed between said sealing ring and the inside wall of said cylindrical vessel; a frictional seal contained at the exposed end of said sealing ring and encircling the port of said sealing ring, said port being the discharge passage of the purifier-filter element; the end section of said cylindrical vessel containing the perforated bottom being axially mounted above one end of a tubular filter by means of a hollow adapter-spacer which seals said end of tubular filter, said adapter-spacer disposed between said tubular filter and a ring gasket resting against the perforated bottom of said cylindrical vessel, the interior of said vessel communicating with the hollow core of said tubular filter by means of a passage through said adapter-spacer, and a closure disposed at the remaining exposed end of said tubular filter.

4,107,046

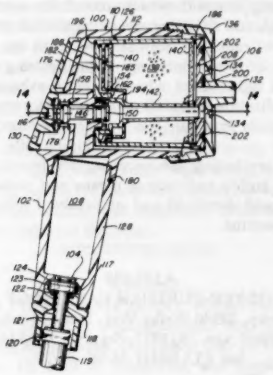
WATER PURIFIER

Thomas E. Corder, Fort Collins, Colo., assignor to Teledyne Industries, Inc., Ft. Collins, Colo.

Continuation of Ser. No. 617,449, Sep. 10, 1975, abandoned. This application Apr. 4, 1977, Ser. No. 784,420

Int. Cl.[2] B01D *27/02, 27/08*

U.S. Cl. 210—282 **37 Claims**



1. For use in a water purifier apparatus, a filter cartridge comprising:

a tubular shell;

an inlet wall substantially closing one end of said shell but having means defining first and third openings therein;

an outlet wall substantially closing the other end of said shell but having means defining second and fourth openings therein;

a conduit extending through the interior of said shell and between said third and fourth openings but exclusive of said first and second openings;

a water-filtering material disposed within said shell in water-flow communication between said first and second openings but exclusive of said third and fourth openings and the interior of said conduit, said material substantially filling the entire space within said shell and surrounding said conduit;

and said shell, said inlet wall, said outlet wall and said conduit being joined together to constitute a unitary cartridge assembly, with a portion of said conduit adjacent to said inlet wall being shaped to a conformation receptive of water-flow-control means cooperative therewith.

11. An internally by-passable water purifier comprising:

a housing having an upstream portion and a downstream portion and defining through said portions a channel for the flow of water;

inlet means in said upstream portion of said housing for admitting a flow of water into said channel;

outlet means in said downstream portion of said housing for discharging a flow of water from said channel

a unitary filter-material-containing water-purifying cartridge having a tubular shell closed by inlet and outlet walls to contain said material, a first opening in said inlet wall and a second opening in said outlet wall;

means defining a chamber in said upstream portion of said housing for receiving said cartridge in said channel to establish a first path of flow through said first and second openings;

means running lengthwise of said chamber and of said inlet and outlet walls of said cartridge received therein and exteriorly outward of said tubular shell to establish a second path of flow in exclusive by-pass of said filter material contained within said cartridge;

means including a first valve disposed within said downstream portion of said housing in said channel for controlling the flow of water from said inlet means through said first and second openings of said cartridge to said outlet means;

and means including a second valve disposed within said downstream portion of said housing in said channel for controlling the flow of water from said inlet means to said outlet means by way of said second path of flow in exclusive by-pass of said filter material.

4,107,047

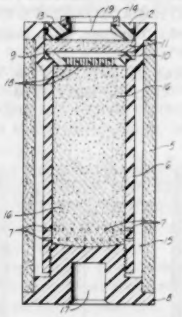
FILTER-PURIFIER CARTRIDGE

Isadore Turetsky, 23940 Welby Way, Los Angeles, Calif. 91307

Filed Feb. 24, 1977, Ser. No. 771,777

Int. Cl.[2] B01D *27/00*

U.S. Cl. 210—337 **4 Claims**



1. A filter-purifier cartridge for liquids adapted to be inserted in a filter apparatus, comprising: a tubular purifier element containing a purifying medium within its hollow core, said tubular element being concentrically enlarged at one end section, an internal shoulder within, an outlet passage, and an external flange at said enlarged end section; a perforated disk inserted and contained against said internal shoulder by a similarly inserted permeable porous disk and a sealing ring within the hollow core of said enlarged tubular section, and circumferentially disposed perforations at the opposite unexpanded internally threaded end section of said tubular purifier element; said tubular purifier element inserted into the hollow core of a tubular filter, one end of said tubular filter being sealed and positioned by the flange and enlarged circumferential end section of the tubular purifier element; the unexpanded section of said tubular purifier element being spaced from the sidewall of the tubular filter by means of a flanged, threaded, hollow step-type plug, the threaded section of said step-type

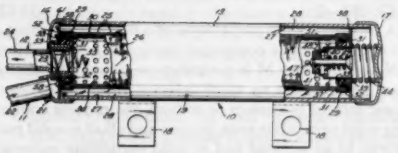
plug being inserted into the internally threaded end section of said tubular purifier element, the adjacent end of said tubular filter being sealed and positioned by the unthreaded section and flange of said hollow step-type plug; a purifying medium contained within the hollow core of said purifier element between the perforated disk resting against the internal shoulder of the expanded end section of said purifier element, and said hollow step-type plug; said hollow core of the purifier element communicating with the annular space between the positioned tubular filter and said purifier element by means of the circumferentially disposed perforations in said tubular purifier element.

4,107,048

TURBULENCE AMPLIFIER BAFFLE

Raymond N. Darash, Euclid, Ohio, assignor to The Weatherhead Company, Cleveland, Ohio

Filed Feb. 4, 1977, Ser. No. 765,757
Int. Cl.[2] B01D *29/10*
U.S. Cl. 210—407 **7 Claims**



1. A filter assembly for treating a fluid comprising a circular, thin-walled housing having interior and exterior surfaces, an inlet and an outlet for admitting and discharging fluid to and from the interior of the housing, an elongated filter element extending lengthwise within the housing, the filter element having an outer surface spaced radially inwardly from the interior surface of the housing to provide therebetween an axially extending fluid flow path, means for directing fluid admitted at the inlet towards the flow path, said fluid directing means including a circular chamber at one end of said housing having a major diameter generally equal to the diameter of the housing interior, said fluid-directing means including swirl-inducing means for causing fluid to travel in a helical pattern through said flow path and about the outer surface of the filter, said swirl-inducing means being constructed and arranged to be substantially fully operative on substantially all of said fluid prior to its passage into said flow path, a wall extending between and separating said chamber and said flow path, a plurality of apertures circumferentially spaced on said wall for admitting fluid from said chamber into said flow path, said swirl-inducing means including a flow-deflecting fin associated with each aperture, all of said fins extending from said apertures in a direction away from said flow path, said swirl-inducing means being constructed and arranged to gradually accelerate flow into a helical path whereby internal heating of fluid is thereby substantially avoided.

4,107,049

PROCESS FOR PRODUCING SEMIPERMEABLE MEMBRANES

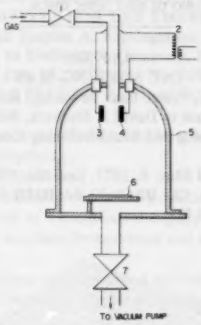
Takezo Sano, Takatsuki; Takatoshi Shimomura, Toyonaka; Masao Sasaki, Osaka, and Ichiki Murase, Ibaragi, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Oct. 27, 1976, Ser. No. 736,071
Claims priority, application Japan, Oct. 30, 1975, 50-131253
Int. Cl.[2] B29D *27/04;* **B01D** *31/00, 39/00*
U.S. Cl. 210—490 **18 Claims**

1. A method for the preparation of semipermeable membranes which comprises exposing porous shaped articles of polyacrylonitrile or copolymers containing acrylonitrile in an amount of more than 40% by mole to a plasma consisting essentially of a gaseous organic compound or mixture of said gaseous organic compound and an inert gas at room temperature under a pressure of 0.01 to 10 Torr, wherein said porous shaped articles of said polymeric material are prepared by a method comprising the steps of;

(a) dissolving the polymeric material in a solvent,

(b) casting the resulting solution,



(c) dipping the cast solution in a non-solvent to prepare a porous membrane after partial evaporation of the solvent of the solution or without evaporation thereof, and

(d) drying the wet porous membrane thus obtained.

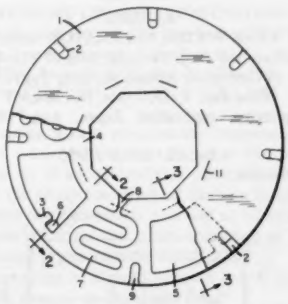
15. A heterogeneous membrane obtained by the method of claim 1, which has a modified dense layer in the vicinity alone of the surface thereof and pores increasing in size gradually towards the back surface of the membrane.

4,107,050

FILTER CARTRIDGE

Harold Wilansky, Big Flats, N.Y., assignor to The Hilliard Corporation, Elmira, N.Y.

Filed Jul. 26, 1977, Ser. No. 819,220
Int. Cl.[2] B01D *25/04, 25/16*
U.S. Cl. 210—492 **3 Claims**



1. A cartridge for filtering oily liquids which are contaminated with entrained immiscible material including water, comprising

a plurality of filter discs,

a plurality of spacer discs of foraminous material, each of said spacer discs being interposed between a pair of said filter discs, said spacer discs having circumferentially arranged cut-out portions forming, with the adjacent filter discs, alternately arranged inlet and outlet chambers, said inlet chambers having inlet passages,

said filter discs having inlet ports registering with said inlet passages, and

enlarged inlet means adjacent each of said inlet ports for

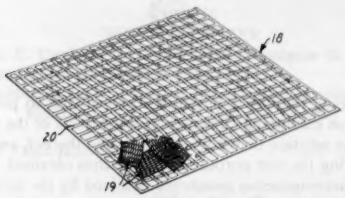
providing an enlarged inlet dimension in a direction parallel to the longitudinal axis of said cartridge, thereby reducing the tendency for the material of said spacer discs adjacent said inlet ports to expand into and clog said inlet ports, the total longitudinal dimension of each of said inlet ports and the respective inlet port means adjacent thereto being the thickness of one of said spacer discs plus the thickness of two of said filter discs.

4,107,051

OIL SORBING MAT

Alan P. Lorentzen, White Bear Township, Ramsey County, both of Minn., assignor to David J. Bucheck, North Saint Paul and Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Mar. 4, 1977, Ser. No. 774,669
Int. Cl.[2] B01D *39/14;* B32B *5/12*
U.S. Cl. 210—500 R **10 Claims**



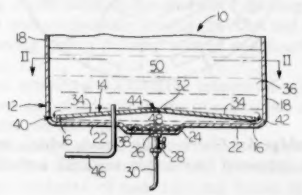
1. Oil sorbing mat comprising a plurality of sections of fibrillated film which are (a) expanded at least four times their transverse width prior to fibrillation to form a net-like structure and (b) assembled one over the other and attached in said expanded condition to form a fluffy bulky flexible resilient handleable integral structure having a bulk density of about 0.02 gram per cubic centimeter or less in which the openings in the sections are overlapped to establish a network of interstices into which oil can be received and stored, said mat having a sorbency number with No. 5 fuel oil at 24° C of at least 20.

4,107,052

FUEL TANK WATER SEPARATOR ASSEMBLY

Tsuneo Yoshino, and Junji Tatsuma, both of Yokohama, Japan, assignors to Caterpillar Mitsubishi Ltd., Tokyo, Japan

Filed Jun. 9, 1977, Ser. No. 804,957
Claims priority, application Japan, Aug. 10, 1976, 51-106144[U]
Int. Cl.[2] B01D *12/00*
U.S. Cl. 210—534 **3 Claims**



1. A fuel tank water separator assembly comprising:
a tank including a concave sump portion having a normally closed drain member therein;
a water separating plate of a convex configuration defining a substantially centrally located apex and a plurality of sloping portions depending therefrom to a lower edge, said plate connected to said tank in juxtaposed position over said concave sump portion and defining communicating upper and lower chambers, said sloping portions serving to promote through gravity downward movement of water away from said apex toward said lower edge;
first opening means defined between said lower edge and said tank for communicating said chambers and providing a flow path for said water from said upper chamber into said lower chamber; and
second opening means defined at said apex of said plate for passing displaced fuel from said lower chamber to said upper chamber.

4,107,053

PREPARATION OF THE REACTION PRODUCT OF UREA AND ALKALI METAL HYDROXIDE OR CARBONATE

Rowland Kennington, and Robin Andrew Woolhouse, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Nov. 1, 1976, Ser. No. 737,272
Claims priority, application United Kingdom, Nov. 14, 1975, 47040/75
Int. Cl.[2] A62D *1/00*
U.S. Cl. 252—2 **16 Claims**

1. A process for the preparation of a fire-extinguishing composition comprising a compound having an empirical formula $MC_2N_2H_3O_3$, where M is potassium or sodium, by reacting a mixture of urea and an alkali selected from hydroxides and carbonic salts of potassium or sodium, the process comprising adding solid particulate urea, or urea and alkali in solid particulate form, to an agitated bed of solid particulate material, the bed of particulate material being heated to a temperature in the range 95° C to 200° C and comprising at least alkali in the case where urea alone is added, and the rate of addition of the urea, or of the urea and alkali, being controlled to maintain the bed in a solid particulate form.

4,107,054

LUBRICATING OIL COMPOSITIONS

Warren W. Woods, San Diego, Calif., assignor to Continental Oil Company, Ponca City, Okla.

Filed Jun. 27, 1977, Ser. No. 810,214
Int. Cl.[2] C10M *1/40, 3/34, 5/22, 7/38*
U.S. Cl. 252—33.4 **14 Claims**

1. A lubricating oil composition, having improved rust inhibiting properties, said composition comprising (a) a major amount of a base lubricating oil, (b) from about 0.5 to about 10 weight percent of an alkenyl succinimide dispersant and (c) a rust inhibiting amount, in the range of about 0.06 to about 1 weight percent of an acidic derivative of benzene selected from the group consisting of anthranilic acid, 2-amino-5-alkylbenzoic acid, wherein the alkyl group is methyl or ethyl, and 4-alkyl catechol, wherein the alkyl group is methyl or ethyl.

10. The lubricating oil composition of claim 1 wherein it contains from about 0.1 to about 5 weight percent of an overbased metal sulfonate.

4,107,055

FABRIC COATING COMPOSITIONS, METHOD AND COATED FABRIC HAVING DRY SOIL RESIST FINISHES

Bernard Sukornick, Williamsville, N.Y.; Pritam Singh Minhas, Mendham, N.J., and Richard Francis Sweeney, Elma, N.Y., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Dec. 15, 1976, Ser. No. 751,003
Int. Cl.[2] D06M *15/36*
U.S. Cl. 252—8.6 **37 Claims**

1. A composition consisting essentially of:
from about 0.25% to about 55% by weight of an essentially nonhalogenated polymer having a glass transition temperature above room temperature;
from about 0.05 to about 50% by weight of polymer of an ionic, non-polymeric fluoro surfactant with from 5 to 30 carbons per hydrophilic end; and

at least about 40 percent by weight of composition of a carrier in which said polymer is dissolved or suspended.

4,107,056

NOVEL POLYACETAL POLYMERS AND THEIR APPLICATION AS A SOIL-RELEASE AND ANTI-SOIL REDEPOSITION AGENTS FOR TEXTILE SUBSTRATES

Robert Violland, Lyons, and Alain Lagasse, Villeurbanne, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Jul. 9, 1976, Ser. No. 703,827
Claims priority, application France, Jul. 10, 1975, 75 22626
Int. Cl.[2] D06M *13/12*
U.S. Cl. 252—8.8 **13 Claims**

1. An aqueous solution containing from about 2.10^{-3} to about 5% by weight of a hydrophilic polyacetal polymer prepared by reacting Reactant Composition I comprising:

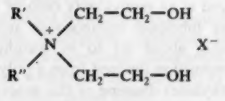
(A) 20-60 weight percent of a component (A) which is a reaction product of a phthalic acid, phthalic anhydride or a phthalic diester and at least one saturated diol having a molecular weight less than 300, said reaction product having a hydroxyl number of between 150 and 500 and an acid number of less than 2,

(B) 40-80 percent of a component (B) comprising:

1. a mixture comprising:

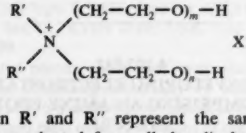
(a) 50 to 100 weight percent of a hydroxylated compound represented by the general formula R $(OC_xH_{2x})_n$—OH wherein R represents a hydrogen or a hydrocarbyl radical selected from the group consisting of alkyl, cycloalkyl, aryl, alkaryl, and aralkyl containing 1 to 20 carbon atoms, *x* is 2, 3, or 4 and *n* is an integer such that molecular weight ranges from between 300 and 10.000,

(b) 0-50 weight percent of a quaternary dialkyl diethanolamine having the formula:



wherein R′ and R″ represent the same or different alkyl groups containing less than 5 carbon atoms or a benzyl radical and X^- is a halogen or methylsulfate ion, or

2. 100 weight percent of a quaternary ammonium compound containing both oxyalkylene units and a quaternized nitrogen atom represented by the formula:



wherein R′ and R″ represent the same or different members selected from alkyl radicals containing less than 5 carbon atoms or benzyl radicals, and m and n are numbers the sum of which is less than 15 and X^{31} is a halide or methylsulfate ion,

with

Rectant Composition II comprising an aldehyde having the formula:

wherein R_1 represents a hydrogen atom, and alkyl, an aryl or an alkenyl group containing 1 to 10 carbon atoms; wherein the number of mols of alkehyde is at least equal to half the total number of hydroxyl groups contained in Reactant Composition I.

4,107,057

METHOD OF PREPARING AND USING ACIDIZING AND FRACTURING COMPOSITIONS, AND FLUID LOSS ADDITIVES FOR USE THEREIN

Walter R. Dill, and Eugene A. Elphingstone, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

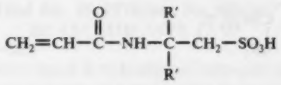
Filed Jan. 19, 1977, Ser. No. 760,485
Int. Cl.[2] E21B *43/27, 43/26*
U.S. Cl. 252—8.55 C **17 Claims**

1. An acidizing composition for use in acidizing a subterranean formation comprising

an acidic base fluid; and

from about 25 pounds to about 100 pounds per 1000 gallons of the base fluid of a crosslinked copolymer of a sulfonic acid-modified acrylamide monomer and a polyvinyl crosslinking agent;

wherein said sulfonic acid-modified acrylamide monomer is characterized in having the structural formula:



wherein R′ and R″ are selected from the group consisting of CH_3—, CH_2Cl—, CH_3—CH_2—, CH_3—CH_2—CH_2—, and H, and may be the same or different; and

wherein said polyvinyl crosslinking agent is an alkylidene bisacrylamide in which the alkylidene group contains from one to three carbon atoms; and still further

wherein said crosslinked copolymer contains from about 0.1 to about 20 weight percent of the polyvinyl crosslinking agent and the balance is the sulfonic acid-modified acrylamide monomer.

4,107,058

PRESSURE GREASE COMPOSITION

George A. Clarke, and Gary L. Harting, both of Westfield, N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Aug. 19, 1977, Ser. No. 826,175
Int. Cl.[2] C10M *3/18, 5/14, 7/20, 7/24*
U.S. Cl. 252—18 **11 Claims**

1. A lubricating grease composition comprising a major proportion of a base oil stock, a thickener and an additive package made up of an oil insoluble phosphorus compound selected from the group consisting of alkali metal and alkaline earth metal salts of a phosphorus acid and an oil soluble sulfur compound selected from the group consisting of sulfurized hydrocarbons and organometallic sulfur salts.

6. The composition of claim 5 wherein the thickener comprises a lithium soap or an aluminum soap.

7. The composition of claim 6 wherein said phosphorus compound is tricalcium phosphate.

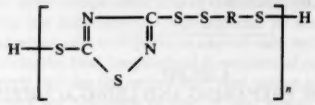
4,107,059

POLYMER OF 1,2,4-THIADIAZOLE AND LUBRICANTS CONTAINING IT AS AN ADDITIVE

James Ping King, Lansdale; Everett A. Mailey, Norristown, and Ivan Christoff Popoff, Ambler, all of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

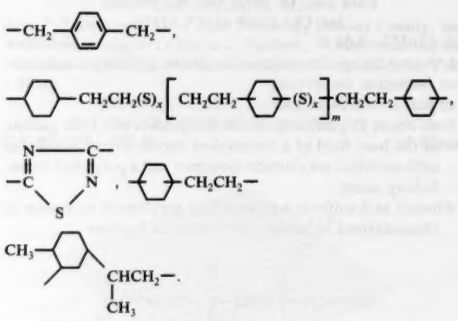
Filed Jun. 27, 1977, Ser. No. 810,137
Int. Cl.[2] C10M *1/10, 3/02;* **C08F** *28/00;* **C08G** *75/00*
U.S. Cl. 252—28 **8 Claims**

1. A composition having the formula



wherein

R is selected from the group consisting of



phenylene, an alkylene or substitute alkylene of 2–50 carbons. cyclic alkylene or substituted cyclic alkylene of 5–50 carbons wherein the alkylene or cyclic alkylene can contain oxygen and/or sulfur atoms, or $(S)_x$ groups;

m is an integer of 0–10;

n is an integer of 5–100;

x is an integer of 1–5.

4. A lubricating composition comprising a major amount of a lubricating grease or liquid and a minor amount of the composition of claim **1**.

4,107,060

LUBRICANT COMPOSITIONS CONTAINING BIOCIDAL, ANTIRUST ADDITIVES

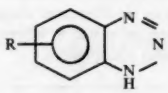
John W. Schick, Cherry Hill, and Robert H. Davis, Pitman, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 587,761, Jun. 17, 1975, abandoned, which is a continuation-in-part of Ser. No. 353,178, Apr. 20, 1973, abandoned. This application Mar. 31, 1977, Ser. No. 783,239

Int. Cl.[2] **C10M** *1/06*

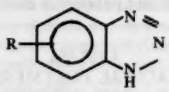
U.S. Cl. 252—49.3 **13 Claims**

1. A composition which comprises a lubricant base selected from the group consisting of oils of lubricating viscosity, water, and emulsions thereof; and in a biocidal and rust preventative amount, an additive consisting essentially of the reaction product of (a) a benzotriazole compound having the formula:



where R is hydrogen or an alkyl group containing from about 1 to about 6 carbon atoms and (b) a water soluble base, characterized by a basicity greater than that of said benzotriazole compound, which is selected from the group consisting of alkanol and hydrocarbylamines wherein said water soluble base is reacted with said benzotriazole in mole proportions from about 1:1 to about 5:1 and at a temperature of from about 10° to about 90° C.

8. The reaction product of (a) a benzotriazole compound having the formula:



where R is hydrogen or an alkyl group containing from about 1 to about 6 carbon atoms and (b) a water soluble base, characterized by a basicity greater than that of said benzotriazole compound, which is selected from the group consisting of alkanol and hydrocarbyl amines wherein said water soluble base is reacted with said benzotriazole in mole proportions of from 1:1 to about 5:1 and at a temperature of from about 10° to about 90° C.

4,107,061

AMINO-AMIDE LUBRICANTS DERIVED FROM POLYMERIC FATTY ACIDS AND POLY(OXYETHYLENE) DIAMINES

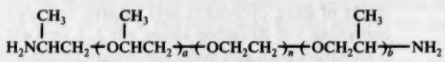
Robert J. Sturwold, and Mark A. Williams, both of Cincinnati, Ohio, assignors to Emery Industries, Inc., Cincinnati, Ohio

Filed Nov. 7, 1977, Ser. No. 848,848

Int. Cl.[2] **C10M** *1/06, 3/04;* **C09F** *5/00, 7/00*

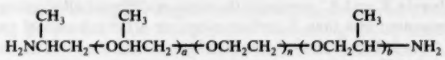
U.S. Cl. 252—49.3 **11 Claims**

1. Amino-amide compositions comprising the reaction product of a poly (oxyethylene) diamine of the general formula



where the sum of $a+b$ is between 1 and 5 and n is a positive integer such that the average molecular weight is between about 500 and 1,000 and a polymeric fatty acid, said respective reactants employed at an equivalents ratio of 1.7–2.3:1.

9. An aqueous lubricant composition suitable for metal working containing about 0.1 to 40 weight percent of an amino-amide composition derived from a polymeric fatty acid and a poly(oxyethylene) diamine of the general formula:



where the sum of $a+b$ is between 1 and 5 and n is a positive integer such that the average molecular weight is between 500 and 1,000 and reacted at an equivalents ratio of 1:1.7-2.3.

4,107,062

TONER FOR DEVELOPING ELECTROSTATIC LATENT IMAGES COMPRISING AN AMINE-EPOXY RESIN MIXTURE

Makoto Tomono, Hino; Goichi Yamakawa, Hachioji, and Mitsunori Ohta, Kunitachi, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jan. 4, 1977, Ser. No. 756,627

Claims priority, application Japan, Jan. 13, 1976, 51-3559

Int. Cl.[2] **G03G** *9/08*

U.S. Cl. 252—62.1 P **8 Claims**

1. A toner for use in the dry development of electrostatic images comprising:

a colorant; and

a resin mixture of (A) at least 20% by weight of an amine-epoxy resin obtained by reacting an epoxy resin and an aliphatic primary or secondary monoamine having at least 8 carbon atoms and (B) a definite amount up to 80% by weight of an epoxy resin which is not reacted with an amine.

4,107,063

WATER BASED SELECTABLE CHARGE MAGNETIC INKS

Zlata Kovac, Somers, and Carlos Juan Sambucetti, Groton-on-Hudson, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 2, 1977, Ser. No. 773,578
Int. Cl.[2] H01F *1/28;* C09D *11/00*
U.S. Cl. 252—62.52 37 Claims

1. A water based magnetic ink comprising in combination magnetite particles having a coating of an adsorption site providing material taken from the group of organic sulfates, sulfonates and amino carboxylates and having chemically attached thereto a non-ionic surfactant taken from the group of polyoxyethylenes, alkylarylpolyether alcohols, and alkylphenolethers, said particles being dispersed in water containing at least one of glycerol and polyethylene glycol.

4,107,064

METAL SEQUESTERING METHOD

Gunner E. Nelson, and Tillmon H. Pearson, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 682,320, May 3, 1976, Pat. No. 4,066,687, which is a division of Ser. No. 385,545, Aug. 3, 1973, Pat. No. 3,980,578, which is a continuation-in-part of Ser. No. 153,816, Jun. 16, 1971, Pat. No. 3,784,486. This application Aug. 15, 1977, Ser. No. 824,401
Int. Cl.[2] C11D *1/86*
U.S. Cl. 252—89 R 9 Claims

1. The method of sequestering sequesterable metal ions in an aqueous solution which comprises introducing into said solution a sequestrant composition selected from the group consisting of:

(a) α,α′-carboxyalkoxy succinic acid, wherein the carboxyalkoxy radicals contain from 2 to about 7 carbon atoms,

(b) water soluble salts of said acids; and

(c) mixtures of (a) and (b),

and a surfactant selected from the group consisting of anionic detergents, cationic detergents, nonionic detergents, ampholytic detergents, zwitterionic detergents and mixtures thereof, the ratio by weight of the surfactant to the sequestrant being from about 10:1 to about 1:10.

4,107,065

ACTIVATED PEROXY COMPOUND BLEACHING COMPOSITIONS AND BLEACHING DETERGENT COMPOSITIONS

Frederick W. Gray, Summit, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Nov. 5, 1975, Ser. No. 629,117
Int. Cl.[2] C11D *7/18, 7/38, 7/56*
U.S. Cl. 252—99 6 Claims

1. An activated peroxy compound particulate solid bleaching composition consisting essentially of sodium perborate tetrahydrate and p-acetaminobenzenesulfonyl chloride wherein the weight ratio of active oxygen of the sodium perborate tetrahydrate to p-acetaminobenzenesulfonyl chloride is in the range of 1:10 to 1:3.

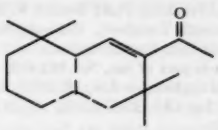
4,107,066

SUBSTITUTED ACETONAPHTHONES, PROCESSES FOR PREPARING SAME, USES OF SAME IN PERFUMERY, AND INTERMEDIATES USED IN SAID PROCESSES

William L. Schreiber, Jackson; James N. Siano, Keyport, both of N.J., and Edward J. Shuster, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., Union Beach, N.J.

Division of Ser. No. 740,890, Nov. 11, 1976, Pat. No. 4,076,749. This application Jul. 28, 1977, Ser. No. 819,959
Int. Cl.[2] C11D *3/50*
U.S. Cl. 252—132 1 Claim

1. A perfumed article having a vetiver aroma comprising a composition of matter containing a mixture of three compounds defined by the structure:



wherein one of the dashed lines is a carbon-carbon double bond and each of the other of the dashed lines is a carbon-carbon single bond and a detergent or soap.

4,107,067

DETERGENT COMPOSITION

Alan Pearce Murphy, and John Rene Paris, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 25, 1976, Ser. No. 699,762
Int. Cl.[2] C11D *3/075, 17/00*
U.S. Cl. 252—135 12 Claims

1. A gelatinous liquid or flowable gel detergent composition which comprises greater than about 40% by weight of a nonionic alkylene oxide detersive surfactant, from about 2% to about 10% by weight of a detergency builder salt, the balance comprising water, said detergent composition being in the form of an inversed emulsion, said inversed emulsion consisting of:

(a) a first, continuous phase comprising hydrated, nonionic alkylene oxide detersive surfactant in the form of neat liquid crystals; and

(b) a second, disperse phase comprising an aqueous solution of detergency builder salt, said disperse phase being substantially homogeneously distributed throughout said continuous phase.

4,107,068

ACRYLONITRILE-CAPPED POLYETHER-SILOXANES

Bela Prokai, Mahopac, and Bernard Kanner, West Nyack, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 627,251, Oct. 30, 1975, Pat. No. 4,043,951. This application May 19, 1977, Ser. No. 798,611
Int. Cl.[2] C08J *9/00*
U.S. Cl. 252—182 7 Claims

1. A solution composition comprising components (1), (2), (3) and (4) wherein component (1) comprises an acrylonitrile-capped polyoxyalkylene-polysiloxane polymer containing at least one silicon-bonded acrylonitrile-capped polyoxyalkylene radical having the average formula $-R''(X)_q(OC_3H_6)_n(OC_2H_4)_mOCH_2CH_2CN$ wherein R″ is an alkylene radical, free from unsaturation, and containing from 2 to 6 carbon atoms, wherein X is a bridging group selected from the class consisting of —CO— and —NHCO—, wherein q has a value of 0 or 1, wherein m has a value of from 4 to 30 and wherein n has a value of from 0 to 10; component (2) is a water soluble organic acidic component present in said solution in an amount from about 5 to about 90 parts by weight per 100 parts by weight of said polymer; component (3) is a water soluble, silicon-free organic surfactant; and component (4) is a water soluble glycol; the combined total weight of components (3) and (4) present in said solution ranging from about 5 to about 90 parts by weight per 100 parts by weight of said polymer.

4,107,069

STORAGE-STABLE PRECURSORS FOR RIGID POLYURETHANE FOAMS

Alfred A. Keller, Freehold, N.J.; Robert V. Russo, Brooklyn, N.Y., and Kenneth Treadwell, Rahway, N.J., assignors to M&T Chemicals Inc., Stamford, Conn.

Continuation-in-part of Ser. No. 592,473, Jul. 2, 1975, abandoned. This application Jun. 18, 1976, Ser. No. 697,525

Int. Cl.[2] C08G *18/06, 18/28*

U.S. Cl. 252—182 **10 Claims**

1. A stable precursor for preparing rigid cellular polyurethanes, said precursor consisting essentially of

(a) a polyol containing at least 2 active hydrogen atoms, as determined by the Zerewitinoff method,

(b) a silicone-containing surfactant in an amount from about 1 to 5 parts by weight per 100 parts of said polyol,

(c) halogen-containing hydrocarbon, boiling from 30° to 90° C, blowing agents in an amount from about 10 to 50 parts by weight per 100 parts of said polyol, and

(d) a catalytically effective amount of a gel catalyst composition consisting of a tertiary amine and an alkali metal salt of a carboxylic acid containing from 2 to 20 carbon atoms.

4,107,070

PROCESS FOR IMPROVING THE PROPERTIES OF OXYSULFIDE PHOSPHOR MATERIALS

Clifford Leon Everts, Hilton; David Michael Taylor, and Paul John Delmore, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 29, 1976, Ser. No. 746,034

Int. Cl.[2] C09K *11/46*

U.S. Cl. 252—301.4 S **16 Claims**

1. A process for improving the x-ray luminescent properties of a rare-earth activated yttrium, lanthanum, or gadolinium oxysulfide phosphor material that has been subjected to grinding,

comprising heating the phosphor material while exposed to an oxygen-containing atmosphere at a temperature of about 600° to about 1000° C for a time sufficient to improve the x-ray luminescent properties of the ground phosphor material.

4,107,071

METHOD OF PRODUCING MICROCAPSULES AND RESULTING PRODUCT

Robert G. Bayless, Yellow Springs, Ohio, assignor to Capsulated Systems, Inc., Yellow Springs, Ohio

Filed Feb. 16, 1977, Ser. No. 768,968

Int. Cl.[2] B01J *13/02*

U.S. Cl. 252—316 **12 Claims**

1. A method of producing microcapsules having a capsule core material surrounded by a densified protective wall which comprises

(1) forming an agitated system which includes (a) a liquid vehicle as a major component of the system and constituting a continuous first phase, (b) a plurality of discrete capsule core material entities dispersed in said liquid vehicle and constituting a discontinuous second phase, and (c) partially-hydrolyzed poly(ethylene-vinyl acetate) containing about 60 to about 80 mol percent ethylene and having a melt index of about 18 to about 50, said capsule core material being wettable by said partially-hydrolyzed poly-(ethylene-vinyl acetate);

(2) adding to said system a phase separation-inducing material in an amount sufficient to separate said partially-hydrolyzed poly(ethylene-vinyl acetate) from said continuous first phase and thereby forming a sheath of said partially-hydrolyzed poly(ethylene-vinyl acetate) and liquid vehicle entrapped therein about said capsule core material entities;

(3) extracting at least a major portion of the entrapped liquid vehicle from said sheath, thereby reducing the thickness of said sheath, by adding to said system said phase separation-inducing material in an amount sufficient to increase the concentration thereof in said liquid vehicle by at least about 30 weight percent in excess of the concentration required to effect formation of said sheath;

(4) cross-linking said partially-hydrolyzed poly(ethylene-vinyl acetate) in said sheath to form a protective wall about said capsule core material.

4,107,072

PROCESS OF ISOLATING CYCLOHEXANE-FREE ETHYLCELLULOSE MICROCAPSULES

Lewis D. Morse, Princeton, N.J.; Melvin J. Boroshok, Yonkers, N.Y., and Roy W. Grabner, North Plainfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed May 25, 1973, Ser. No. 364,222

Int. Cl.[2] B01J *13/02*

U.S. Cl. 252—316 **5 Claims**

1. In the process of isolating ethylcellulose-walled microcapsules from a cyclohexane medium, the improvement which comprises displacing the cyclohexane adhering to the said microcapsules by C_{5-8} alkanes.

4,107,073

PULP AND PAPERMAKING ADDITIVE

Joseph A. Maciaszek, Bridgeview, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Continuation-in-part of Ser. No. 778,414, Mar. 17, 1977, abandoned. This application Aug. 22, 1977, Ser. No. 826,433

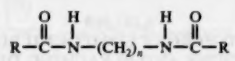
Int. Cl.[2] B01J *13/00*

U.S. Cl. 252—321 **10 Claims**

1. An antifoam and drainage aid composition useful in pulping and papermaking processes which consists of a water-based emulsion composition as follows:

(a) Hydrophobic silica

(b) Bisamide of the following formula:



where

n is an integer from 1 to 6; and

R is a saturated or unsaturated, straight or branched chain hydrocarbyl group having from 5 to 22 carbon atoms

(c) Acid containing crosslinked copolymer of acrylic acid

(d) Dioctyl sulfosuccinate

(e) Paraffin oil

(f) Water

4,107,074

PROCESS FOR PREPARING AMINOALKYLPYRROLOBENZOXAZALKANES

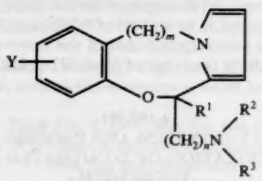
Richard C. Effland, Bridgewater; Larry Davis, Flemington, both of N.J., and Wolfgang Schaub, Kelkheim, Fed. Rep. of Germany, assignors to American Hoechst Corporation, Bridgewater, N.J.

Division of Ser. No. 661,505, Feb. 26, 1976, Pat. No. 4,029,672. This application Jan. 19, 1977, Ser. No. 760,507

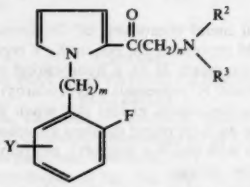
Int. Cl.[2] C07D *491/04*

U.S. Cl. 260—326.5 B **4 Claims**

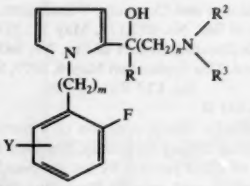
1. A process for the preparation of an aminoalkylpyrrolobenzoxazalkane of the formula



wherein Y is hydrogen, halogen, lower alkoxy, lower alkyl, trifluoromethyl, nitro or amino; R^1 is lower alkyl; R^2 is hydrogen, alkyl of from 1 to 5 carbon atoms, phenyl, phenylalkyl of the formula $C_6H_5(CH_2)_n$—, cycloalkyl of from 3 to 6 carbon atoms or cycloalkylalkyl of from 4 to 7 carbon atoms; R^3 is alkyl of from 1 to 5 carbon atoms, phenyl, phenylalkyl of the formula $C_6H_5(CH_2)_n$—, cycloalkyl of 3 to 6 carbon atoms or cycloalkylalkyl of from 4 to 7 carbon atoms; m is 1 or 2 and n is 1, 2 or 3; which comprises reacting a pyrrylamino ketone of the formula



with a Grignard reagent of the formula R^1MgX wherein X is bromine or chlorine under Grignard conditions; hydrolizing the reaction mixture to form a pyrrylamino alkanol of the formula



and reacting said pyrrylamino alkanol with a mineral base to effect condensation to said aminoalkylpyrrolobenzoxazalkane.

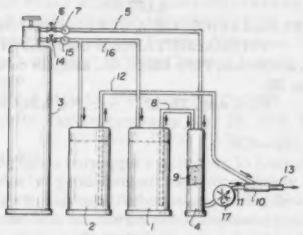
4,107,075

APPARATUS FOR SPRAYING PLASTIC FOAM

Fritz Kramer, 911 Promontory Dr. West, Newport Beach, Calif. 92660

Filed Dec. 9, 1974, Ser. No. 530,982
Int. Cl.² B01J *13/00*
U.S. Cl. 252—359 E **1 Claim**

1. A plastic foam spraying apparatus comprising:
(a) a first container adapted to hold a solution of a urea-formaldehyde precondensate in a first aqueous medium free from catalyst;
(b) a second container adapted to hold a second aqueous medium including a catalyst capable of causing rapid hardening of said precondensate when said first medium is mixed with said second medium;
(c) supply means for supplying a gas under a pressure higher than atmospheric pressure;
(d) conduit means connecting said supply means to said first and second containers;
(e) foaming means including a foaming chamber communicating with said supply means and with said first container for dispersing said gas in said first medium and for thereby forming a foam in said foaming chamber;
(f) a mixing chamber;
(g) a first conduit connecting said foaming chamber to said mixing chamber;
(h) a second conduit connecting said second container to said mixing chamber;
(i) a third conduit leading outward of said mixing chamber and terminating in an orifice normally open to the atmosphere, whereby said gas under pressure
(1) conveys said foam from said foaming chamber to said mixing chamber through said first conduit,



(2) conveys said second medium from said second container to said mixing chamber through said second conduit,
(3) mixes the conveyed foam and the conveyed second medium in said mixing chamber, and
(4) conveys the mixture so produced outward of said mixing chamber through said third conduit when said orifice is open to the atmosphere; and
(j) check valve means in said first conduit for preventing flow of said mixture toward said foaming chamber when said orifice is blocked.

4,107,076

CATALYST SYSTEM FOR CATALYZING THE WATER GAS SHIFT REACTION

Richard Eisenberg, and Chien-Hong Cheng, both of Rochester, N.Y., assignors to University of Rochester, Rochester, N.Y.

Filed Mar. 31, 1977, Ser. No. 783,133
Int. Cl.² C01B *2/06*
U.S. Cl. 252—373 **33 Claims**

1. In a method for effecting the water gas shift reaction, the improvement which comprises contacting water and carbon monoxide reactants in the presence of a homogeneous catalyst system at a temperature from about 80° C to less than 95° C, said homogeneous catalyst system being formed essentially by combining $[Rh(CO)_2Cl]_2$, an iodide salt of a non-interacting cation, a strong acid selected from the group consisting of HCl and HBF_4, water and acetic acid, the ratio of iodide to rhodium being at least 50 to 1 and the ratio of water to hydrogen cations being about 5 to 100 to 1 in said catalyst system, thereby producing hydrogen and carbon dioxide.

4,107,077

LIMULUS LYSATE OF IMPROVED SENSITIVITY AND PREPARING THE SAME

James D. Sullivan, Jr., and Stanley W. Watson, both of Falmouth, Mass., assignors to Associates of Cape Cod, Inc., Woods Hole, Mass.

Continuation of Ser. No. 595,800, Jul. 14, 1975, abandoned. This application Aug. 12, 1977, Ser. No. 824,226
Int. Cl.² C09K *3/00;* **G01N** *31/00;* **C12K** *1/00*
U.S. Cl. 252—408 **10 Claims**

8. A lysate sensitive to endotoxins derived from horseshoe crabs (Limulus) by a process comprising:
withdrawing hemolymph from horseshoe crabs (Limulus);

preparing a lysate by lysing the amoebocytes obtained from said hemolymph;

treating said lysate with an amount of an organic solvent selected from the group consisting of chloroform, iodoform, bromoform, methylbromide, methylchloride, methyliodide, ethylchloride, ethylbromide, ethyliodide, propylchloride, propylbromide, propyliodide, ethylenechloride, methylenechloride, chlorobenzene, bromobenzene, iodobenzene, dimethylether, diethylether, carbontetrachloride, trichloroethylene, toluene and hexane sufficient to denature a clotting inhibitor present in said lysate; and

isolating said organic solvent treated lysate.

4,107,078

PREPARATION OF A SUPPORTED METAL PHTHALOCYANINE CATALYST

David H. J. Carlson, Park Ridge, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Aug. 22, 1977, Ser. No. 826,620
Int. Cl.[2] B01J *27/24*
U.S. Cl. 252—428 **8 Claims**

1. A method of preparing a supported metal phthalocyanine catalyst which comprises impregnating a solid adsorptive support with a common aqueous dispersion of a metal phthalocyanine and a water soluble carboxylic acid containing up to about 10 carbon atoms, and thereafter drying the resulting catalytic composite.

4,107,079

INSOLUBLE METALLIC COMPLEXES AND CATALYSTS THEREFROM

Yvonick Chevallier, Decines; Jacques-Pierre Martinaud, Lyon; Francois Meiller, Palaiseau, and Jean Berthoux, Decines, all of France, assignors to Rhone-Poulenc Industries, Paris, France

Continuation-in-part of Ser. No. 504,710, Sep. 10, 1974, abandoned. This application Jan. 26, 1977, Ser. No. 762,474
Claims priority, application France, Sep. 10, 1973, 73 33006
Int. Cl.[2] B01J *23/42, 23/44, 23/46, 27/10*
U.S. Cl. 252—429 R **14 Claims**

1. A solid, solvent insoluble catalyst comprising a coordination complex of an insoluble ligand, a Group VIII noble metal and ligands other than said insoluble ligand bonded to said transition metal and having the formula:

$$A - M\,(L')_n\,(L'')_q$$

wherein A is an insoluble ligand prepared by reacting an alkoxysilane or a chlorosilane which contains an amine radical or a carboxylic acid radical with silica or alumina or by reacting a vinylalkoxysilane or a vinylchlorosilane with silica or alumina and the copolymerizing the resultant product with vinylpyridine or acrylic acid; M is a Group VIII noble metal; L' and L'' are the same or different and comprise ligands selected from the group consisting of chlorine, carbon monoxide, olefins, hydrocarbyl substituted amines, phosphines, phosphites and arsines wherein any hydrocarbyl moiety has from 1 to 20 carbon atoms selected from the group consisting of alkyl, cycloalkyl, aryl, aralkyl and alkaryl; and *n* and *q* are integers between about 0 and 6.

4,107,080

PROCESS FOR PREPARING CATALYST FOR OLEFIN POLYMERIZATION

Ryozo Taniyasu, Yokohama; Hideo Kurokawa, Kawasaki, and Takeshi Saito, Chiba, all of Japan, assignors to The Lion Fat and Oil Company Limited, Tokyo, Japan

Filed May 4, 1977, Ser. No. 793,545
Claims priority, application Japan, May 10, 1976, 51-52161
Int. Cl.[2] B01J *31/12, 31/02*
U.S. Cl. 252—431 C **7 Claims**

1. A process for preparing a catalyst for polymerization of a mono olefin having 6 through 20 carbon atoms comprising condensing: (a) an aliphatic carboxylic acid having 3 to 12 carbon atoms and, (b) aluminum chloride, aluminum bromide or a mixture thereof, in an amount of 0.7 through 1.2 mol of the component (b) based upon 1 mol of the component (a) at a temperature within the range of from 30° to 150° C.

4,107,081

CATALYST SYSTEM AND PROCESS FOR POLYMERIZATION OF CONJUGATED DIENES THEREWITH

Adel Farhan Halasa, Bath, and James Edward Hall, Akron, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Jun. 24, 1977, Ser. No. 809,819
Int. Cl.[2] C08F *4/08, 4/52*
U.S. Cl. 252—431 L **8 Claims**

1. A catalyst composition capable of polymerizing butadiene to a high molecular weight polymer having 10–55% 1,2-microstructure consisting essentially of

(a) a trihydrocarbyl aluminum compound in which the hydrocarbyl radicals have 1–10 carbon atoms selected from the class consisting of alkyl, aryl and cycloalkyl radicals; and

(b) an alkali metal compound of the formula M—Y—R, wherein M represents Li, Na, or K; Y represents O, S or NR^1; R represents H or a hydrocarbyl radical of 1–10 carbon atoms; R^1 represents a hydrocarbyl or acyl radical of 1–10 carbon atoms, except that when Y is NR^1, the R and R^1 can each represent divalent groups so that together they form with the N a piperidyl, morpholino or diethylene diamino group;

the concentrations of the respective components giving an Al/alkali metal molar ratio of 0.1/1 to 10/1.

4,107,082

MALACHITE PREPARATION

Joseph Melvin Fremont, Glen Mills, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 687,179, May 17, 1976, abandoned, which is a continuation-in-part of Ser. No. 445,476, Feb. 25, 1974, abandoned. This application May 6, 1977, Ser. No. 794,674
Int. Cl.[2] B01J *27/20*
U.S. Cl. 252—431 R **18 Claims**

11. A process for the production of a particulate cuprous acetylide complex having uniformly dispersed therein bismuth in the amount of 2 to 5 percent by weight based on the amount of copper present, said process consisting essentially of the following steps:

precipitating hydrated copper carbonate particles by the addition to water of solutions of cupric salts and alkali metal carbonate or bicarbonate to form a reaction mixture, said solutions being in such proportions as to maintain the pH about in the range of 5.0 to 8.0,

nucleating and converting the hydrated copper carbonate to basic copper carbonate in the reaction mixture at a temperature of at least about 60° C., and

growing agglomerates of the nucleated crystalline particles by precipitating basic copper carbonate containing bismuth by the addition to the reaction mixture of solutions of cupric salts, bismuth salts and alkali metal carbonate or bicarbonate in such proportions as to maintain the pH about in the range of 5.0 to 8.0 with the reaction mixture at a temperature of at least about 60° C. until the average cross-sectional dimension of the agglomerates of crystallites is at least about 10 microns, and then

subjecting the agglomerated basic copper carbonate as a slurry in aqueous medium at 50° to 120° C., to the simultaneous action of formaldehyde and acetylene at partial pressure of not more than 2 atmospheres, said aqueous medium having a pH of 3 to 10 at the initiation of said subjecting, and continuing the reaction until said complex is obtained.

4,107,083
HYDROCARBON CONVERSION WITH A SELECTIVELY SULFIDED ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

Frank H. Adams, La Grange Park, and H. Peter G. Knapik, Brookfield, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

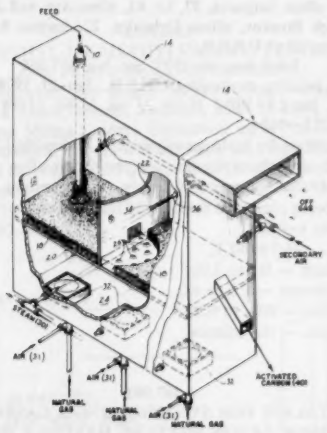
Filed Jun. 6, 1977, Ser. No. 804,136
The portion of the term of this patent subsequent to Jun. 28, 1994, has been disclaimed.
Int. Cl.[2] B01J *27/04*
U.S. Cl. 252—439 **12 Claims**

1. A selectively sulfided acidic catalytic composite comprising a halogenated porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.2 to about 5 wt. % nickel, about 0.01 to about 5 wt. % tin and about 0.1 to about 3.5 wt. % halogen; wherein the platinum group metal, catalytically available nickel, and tin are uniformly dispersed throughout the porous carrier material, wherein substantially all of the platinum group metal is present in the elemental metallic state; wherein substantially all of the tin is present in the form of tin oxide; and wherein substantially all of the catalytically available nickel is present in a sulfided state.

4,107,084
PROCESS FOR ACTIVATING CARBONACEOUS MATERIAL

Albert J. Repik, Charleston; Charles E. Miller, Mt. Pleasant, and Homer R. Johnson, Charleston, all of S.C., assignors to Westvaco Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 585,258, Jun. 9, 1975, abandoned. This application Dec. 6, 1976, Ser. No. 748,098
Int. Cl.[2] C01B *31/10*; B01J *21/18*
U.S. Cl. 252—445 **6 Claims**



1. In a process for continuously activating granular carbon in a fluidized bed system at a temperature between 1,000° F. and 2,200° F. within said system, said system being fluidized with a mixture of combustion gas and an oxidizing gas, the improvement in activation which consists essentially of,

supplying thermal energy to a plurality of fluidized bed compartments in side by side communication with one another whereby said carbon is continuously advanced from a preceding compartment to a succeeding compartment to maintain the temperature at a constant temperature in each bed by providing sufficient excess air to each bed whereby more than 10% of the thermal energy required for activation is supplied by reaction of the excess air in the fluidizing gases with the gaseous products of activation and devolatilization and maintaining a constant temperature within each bed by lowering the temperature of the fluidizing gases to thereby maximize the yield of the activated carbon.

4. The process of claim 1 further comprising injecting air into at least one of said beds at a point above the top of the bed in an amount sufficient to react with volatile products within the off gas from said bed to provide additional thermal energy for the activation process.

4,107,085
PROCESS FOR PRODUCTION OF ATTRITION RESISTANT ANTIMONY OXIDE CONTAINING FLUIDIZED BED CATALYST HAVING CONTROLLED PARTICLE SIZE DISTRIBUTION

Yutaka Sasaki, Yokohama, and Yoshimi Nakamura, Kawasaki, both of Japan, assignors to Nitto Chemical Industry Co., Ltd., Tokyo, Japan

Filed May 18, 1977, Ser. No. 797,957
Claims priority, application Japan, May 19, 1976, 51-56686
Int. Cl.[2] B01J *37/00, 29/16*
U.S. Cl. 252—448 **18 Claims**

1. A process for producing an attrition resistant antimony oxide containing fluidized bed catalyst having a controlled particle size distribution, the process comprising:

(a) preparing a slurry containing a pentavalent antimony compound, one or more polyvalent metal compounds and a silica sol as essential components;

(b) adjusting the pH of the above slurry to not more than about 7 and heating the slurry at a temperature of from about 40° C to about 150° C for at least 20 minutes while keeping the slurry in a slurry state to form a slurry containing pentavalent antimony;

(c) spray drying the thus obtained slurry to form substantially spherical particles;

(d) separating those extremely fine particles and/or coarse particles unsuitable for practical use from the above obtained spherical particles and returning these separated particles to the slurry prior to the spray drying in step (c) as they are or after a pulverization thereof; and

(e) calcining the particles not containing the extremely fine particles and/or coarse particles at a temperature of from about 400° C to about 1100° C.

3. The process according to claim 1, wherein the polyvalent metal compound is a compound of metal selected from the group consisting of iron, cobalt, nickel, tin, uranium, copper, manganese, titanium, vanadium, molybdenum, tungsten, tellurium, bismuth, thorium, cerium, magnesium, zinc, aluminum and zirconium.

4,107,086
CATALYTIC COMPOSITE AND METHOD OF MANUFACTURE

Edward Michalko, Chicago, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 671,893, Mar. 29, 1976, abandoned, and a continuation-in-part of Ser. No. 671,895, Mar. 29, 1976, abandoned. This application Apr. 11, 1977, Ser. No. 786,524
Int. Cl.[2] B01J *29/06*; C07C *3/00, 3/58*
U.S. Cl. 252—455 Z **18 Claims**

1. A catalytic composite comprising a calcined mixture of a refractory inorganic oxide and a zeolite of the mordenite crystal structure, said zeolite having been treated with an aqueous ammoniacal base solution at a pH of at least about 9.5 while containing less than about 5 wt. % sodium, calculated as Na_2O, and thereafter admixed with said refractory inorganic oxide in a weight ratio of from about 1:3 to about 3:1, and calcined to provide said catalytic composite.

10. A method of manufacture providing a catalytic composite of improved activity which comprises subjecting a zeolite of the mordenite crystal structure and containing less than about 5 wt. % sodium, calculated as Na_2O, to an aqueous

ammoniacal treatment at a pH of at least about 9.5, and thereafter admixing said zeolite with a refractory inorganic oxide in a weight ratio of from about 1:3 to about 3:1, and calcining the mixture to provide said catalytic composite.

4,107,087

USE OF CITRIC ACID TO MAKE CATALYST FROM CATALYST FINES

George N. Pessimisis, Berwyn, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Continuation of Ser. No. 672,379, Mar. 31, 1976, abandoned. This application Jul. 21, 1977, Ser. No. 817,479

Int. Cl.[2] B01J *29/06, 27/00, 27/02*

U.S. Cl. 252—455 R **18 Claims**

1. A method of preparing hydrotreating catalysts from silica/alumina catalyst fines which comprises:

A. adding from 1.0 to 15.0% by weight of citric acid to an aqueous slurry of said silica/alumina catalyst fines, said fines being silica/alumina hydrotreating catalyst fines impregnated with:

(1) a metal selected from the group consisting of iron, cobalt, nickel, palladium and platinum; and

(2) a metal selected from the group consisting of chromium, molybdenum, tungsten, selenium and tellurium;

B. mixing, filtering, drying, extruding and calcining to form a hydrotreating catalyst.

8. A method of preparing hydrotreating catalysts which comprises:

A. adding from 1.0 to 15.0% by weight of citric acid to an aqueous slurry containing a mixture of silica/alumina catalyst fines and silica/alumina gel, said fines and gel having been impregnated with:

(1) a metal selected from the group consisting of iron, cobalt, nickel, palladium and platinum; and

(2) a metal selected from the group consisting of chromium, molybdenum, tungsten, selenium and tellurium;

B. mixing, filtering, drying, extruding and calcining said mixture to form a hydrotreating catalyst.

4,107,088

COPOLYMERIZED SILICA HYDROSOL BOUND CRACKING CATALYSTS

Curtis Homer Elliott, Jr., Baltimore, Md., assignor to W. R. Grace & Co., New York, N.Y.

Continuation of Ser. No. 596,922, Jul. 17, 1975, Pat. No. 4,022,714. This application May 6, 1977, Ser. No. 796,644

Int. Cl.[2] B01J *29/00, 29/06*

U.S. Cl. 252—455 Z **9 Claims**

1. A hydrocarbon cracking catalyst which comprises:

(a) clay;

(b) a crystalline aluminosilicate zeolite; and

(c) an inorganic oxide binder comprising silica and from about 0.1 to 10% by weight based on the weight of said silica of an inorganic oxide selected from the group consisting of titanium oxide, zirconium oxide, and mixtures thereof, said binder being prepared by drying an inorganic hydrosol of said binder components having a pH of about 2.0 to 3.2 before gellation occurs.

8. An inorganic oxide binder comprising:

(a) silica; and

(b) from about 0.1 to 10% by weight based on the weight of said silica of an inorganic oxide selected from the group consisting of titanium oxide, zirconium oxide and mixtures thereof, said binder being prepared by drying a hydrosol of said binder components having a pH of about 2.0 to 3.2 before gellation occurs.

4,107,089

CATALYST FOR THE SYNTHESIS OF METHANOL AND METHOD FOR PREPARING SAME

Petr Grigorievich Bondar, prospekt Kosmonavtov, 15, kv. 12; Oleg Nikolaevich Goroshko, ulitsa Donetskaya, 54, kv. 24; Larisa Emmanuilovna Suschaya, prospekt Kosmonavtov, 15, kv. 52; Valentina Vasilievna Lavrova, ulitsa Avtomobilnaya, 7, kv. 49; Valentina Emmanuilovna Leleka, ulitsa Gagarina, 54-b, kv. 36, and Eduard Grigorievich Ilko, ulitsa Parizhskoi Kommuny, 8, kv. 31, all of Severodonetsk Voroshilovgradskoi oblasti, U.S.S.R.

Filed Mar. 14, 1977, Ser. No. 777,333

Int. Cl.[2] B01J *21/04, 21/10, 23/06, 23/26, 23/28, 23/30, 23/72*

U.S. Cl. 252—465 **15 Claims**

1. A catalyst composition for the synthesis of methanol consisting essentially of: copper oxide, zinc oxide and tungsten oxide; and at least one oxide of a difficultly reducible metal selected from the group consisting of aluminum and magnesium.

4,107,090

CATALYST FOR HYDROGENOLYSIS OF N,N-DIMETHYL-3,5-DITERT.BUTYL-4-HYDROXYBENZYLAMINE

Anatoly Borisovich Fasman, ulitsa Kazachya, 3"a"; Dmitry Vladimirovich Sokolsky, ulitsa Kalinina, 71, kv. 4, both of Alma-Ata; Grigory Iosifovich Rutman, ulitsa Revoljutsionnaya, 7, kv. 6; Jury Ivanovich Michurov, prospekt Lenina, 13, kv. 4, both of Sterlitamak, Bashkirskaya ASSR; Viktor Anatolievich Zavorin, 2 Vesnovskaya ulitsa, 45, kv. 88, Alma-Ata; Zoya Stepanovna Shalimova, ulitsa Druzhby, 19, kv. 56, Sterlitamak, Bashkirskaya ASSR; Venera Fatykhovna Timofeeva, ulitsa Zharokova, 184, kv. 5, Alma-Ata; Tulkibai Galikbarovich Dautov, ulitsa I.Nasyri, 13, kv. 96, Sterlitamak, Bashkirskaya ASSR; Daniel Kalimullovich Bazhakov, ulitsa Satpaeva, 37, kv. 41, Alma-Ata, and Jury Mikhailovich Sivakov, ulitsa Dybenko, 22, korpus 5, kv. 385, Moscow, all of U.S.S.R.

Filed Jun. 16, 1977, Ser. No. 807,254

Claims priority, application U.S.S.R., Jun. 21, 1976, 2374525

Int. Cl.[2] B01J *21/04, 23/64, 23/86, 23/88*

U.S. Cl. 252—465 **1 Claim**

1. A catalyst for hydrogenolysis of N,N-dimethyl-3,5-ditert-.butyl-4-hydroxybenzylamine comprising an alloy of nickel, aluminum, chromium, molybdenum and palladium; the components being present in the alloy in the following proportions, percent by weight:

nickel — 39.0 to 47.7;
chromium — 0.3 to 2.0;
molybdenum — 0.5 to 4.0;
palladium — 0.01 to 0.20;
aluminum — the balance.

4,107,091

CATALYST FOR SYNTHESIZING A GASEOUS HYDROCARBON MIXTURE HAVING A HIGH METHANE CONTENT FROM CARBON MONOXIDE AND HYDROGEN

Surjit Singh Khera, Upper Arlington, Ohio, assignor to Battelle Development Corporation, Columbus, Ohio

Division of Ser. No. 638,839, Dec. 8, 1975, Pat. No. 3,997,582. This application Dec. 2, 1976, Ser. No. 746,735

Int. Cl.[2] B01J *21/04, 23/80*

U.S. Cl. 252—466 J **5 Claims**

1. A sulfur resistant catalyst for use in the synthesis of a gaseous hydrocarbon mixture having a high methane content from hydrogen and carbon monoxide which consisting essentially of an interspersed mixture of cobalt oxide, aluminum oxide and zinc oxide, which mixture by elemental analysis contains less than about 0.5 weight percent of alkali metal, with said catalyst comprising about 1 to about 15 percent of cobalt

oxide, about 15 to about 60 weight percent of aluminum oxide and about 35 to about 70 weight percent of zinc oxide.

4,107,092

NOVEL COMPOSITIONS OF MATTER

Robert D. Carnahan, Barrington, Ill.; William C. Holt, Jr., Alexandria, Va., and Karl J. Youtsey, Decatur, Ala., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 335,972, Feb. 26, 1973, abandoned. This application Mar. 24, 1976, Ser. No. 670,014
The portion of the term of this patent subsequent to Nov. 5, 1991, has been disclaimed.
Int. Cl.[2] H01B *1/06*
U.S. Cl. 252—511 5 Claims

1. A composition of matter comprising a polymeric material containing, as a filler therefor, from about 10% to about 95% by weight of a refractory inorganic oxide having a carbonaceous pyropolymer composited on the surface thereof, said filler having a particle size in the range of from about 0.1 microns to about 100 microns and a resistivity in the range of from about 0.001 ohm-centimeters to about 10^{10} ohm-centimeters.

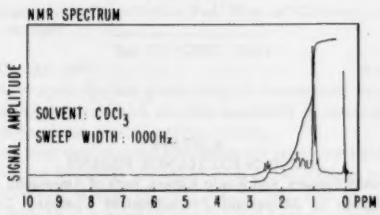
4,107,093

3,3-DIMETHYL-1-(4-METHYLVALERYL)-CYCLOHEXANE PERFUME COMPOSITIONS

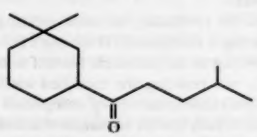
Mark A. Sprecker, Sea Bright; Manfred Hugo Vock, Locust; Frederick Louis Schmitt, Holmdel; John B. Hall, Rumson, and James Milton Sanders, Eatontown, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 713,357, Aug. 11, 1976, Pat. No. 4,062,894.
This application Jul. 28, 1977, Ser. No. 819,954
Int. Cl.[2] C11B *9/00*
U.S. Cl. 252—522 4 Claims

EXAMPLE IV



1. The perfume composition comprising the compound with the structure:



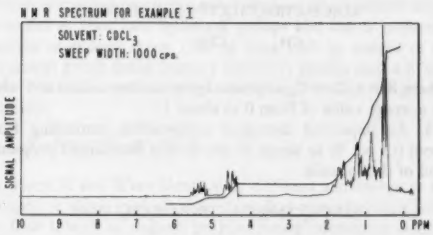
and one or more auxiliary perfume ingredients.

4,107,094

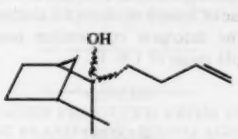
3,3-DIMETHYL 2(3-BUTENYL) NORBORNANOL-2 PERFUME COMPOSITIONS

Kenneth K. Light, Long Branch; Manfred Hugo Vock, Locust, both of N.J.; Edward J. Shuster, Brooklyn, N.Y., and Frederick Louis Schmitt, Holmdel, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 740,937, Nov. 11, 1976, Pat. No. 4,064,184.
This application Sep. 19, 1977, Ser. No. 834,400
Int. Cl.[2] C11B *9/00*
U.S. Cl. 252—522 2 Claims



1. A perfume composition comprising the compound having the structure:



wherein the wavy lines are representative of "exo" or "endo" configurations and at least one adjuvant selected from the group consisting of natural perfume oils, synthetic perfume oils, alcohols, aldehydes, ketones, nitriles, esters and lactones.

4,107,095

LIQUID OLEFIN SULFONATE DETERGENT COMPOSITIONS CONTAINING ANTI-GELLING AGENTS

Stephen Cajetan Klisch, Somerset, and Charles Andrew Martin, Morris Plains, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Apr. 11, 1973, Ser. No. 350,268
Int. Cl.[2] C11D *1/14, 3/34, 17/08*
U.S. Cl. 252—541 4 Claims

1. An aqueous, liquid detergent composition consisting essentially of from 25 to 35% by weight of a water-soluble salt of the reaction product of a sulfonated C_{12}–C_{18} alpha olefin or a mixture of said reaction product salt and a water-soluble salt of a C_{10}–C_{18} ethoxylated alcohol sulfate having 1 to 5 ethenoxy groups, said reaction product and sulfate salts being selected from the group consisting of sodium, potassium, ammonium and mono, di- and triethanolammonium salts, 0.5 to 8% by weight of a C_8–C_{16} alkanoic acid ethanolamide selected from the group consisting of monoethanolamide, diethanolamide and ethoxylated monoethanolamide having 1 to 4 ethenoxy groups and from 2 to 6% by weight of an anti-gelling agent selected from the group consisting of a water-soluble salt of a sulfosuccinate or an allyl sulfonate, the weight ratio of olefin sulfonate to anti-gelling agent being about 16:1 to 2:1, in an aqueous medium, said composition being characterized by resistance to gel formation and ready dissolution of any gel formed.

4,107,096

LOW FOAMING BETA-AMINO PROPIONIC ACID SURFACE ACTIVE AGENTS

Edward E. McEntire, and Robert M. Gipson, both of Austin, Tex., assignors to Texaco Development Corp., New York, N.Y.

Filed Oct. 11, 1977, Ser. No. 840,940
Int. Cl.[2] C11D *1/88, 1/90;* **C07C** *101/04*
U.S. Cl. 252—546 **4 Claims**

1. Low-foaming, surface active beta-amino propionic acids of the formula:

$$RO(CH_2CHO)_nCH_2CHNHCH_2CH_2COOH$$
$$\quad\quad\quad

4,107,099

BOROHYDRIDE EXCHANGE RESINS AND THEIR USES AS REDUCING AGENTS AND IN PREPARATION OF VOLATILE METAL HYDRIDES

Ramesh Subayya Hedge, Danvers, Mass., assignor to Ventron Corporation, Beverly, Mass.

Filed Feb. 10, 1977, Ser. No. 767,243

Int. Cl.[2] C07C *29/14;* C22B *43/00;* C07C *97/00*

U.S. Cl. 521—30 **4 Claims**

1. A method of making an anion exchange resin containing borohydride counter ions which comprises treating a halide form anion exchange resin with a solution containing a borohydride.

4. A composition comprising an anion exchange resin containing cyanoborohydride counter ions.

4,107,100

POROUS, SUBSTANTIALLY FOAM-FREE COMPOSITES

Josef Peterhans; Otto Volkert, both of Ludwigshafen, and Wilhelm Friedrich Beckerle, Bobenheim-Roxheim, all of Fed. Rep. of Germany, assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Jun. 6, 1975, Ser. No. 584,665

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1974, 2427897

Int. Cl.[2] C08G *18/10, 18/14*

U.S. Cl. 521—137 **5 Claims**

1. Porous substantially foam-free composite material, characterized in that granular solid particles of shredded waste-rubber and/or rubber granulates with an averge grain size of 0.1 to 20 millimeters are mixed with

(a) 3 to 50 weight percent of an isocyanate-group-containing prepolymer, relative to the weight of the solid particles; and then with

(b) at least 20 weight percent water, relative to the weight of the isocyanate-group-containing prepolymer, and the reaction mixture thereby produced is permitted to harden.

4,107,101

PROCESS FOR THE PRODUCTION OF CROSSLINKED, URETHANE-CONTAINING PLASTICS

Rolf Kubens, Ordenthal-Hahnenberg, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jun. 2, 1975, Ser. No. 582,970

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1974, 2427089

Int. Cl.[2] C08G *18/28*

U.S. Cl. 521—137 **9 Claims**

1. A process for the production of crosslinked, urethane-containing plastics which consists essentially of reacting

(a) at least one organic polyisocyanate,

(b) at least one organic polyhydroxyl polyester having an average hydroxyl number of from 200 to 1000, an average molecular weight of from 200 to 800, and an average double band content of from 0.1 to 0.5 gram equivalents of C=C double bonds per 100 grams of said polyester, and

(c) at least one olefinically unsaturated monomer having no more than one isocyanate-reactive group and having a boiling point of from 40° to 250° C, the amount of said monomer being such that for every olefinically unsaturated double bond in said polyester, there are from 0.3 to 5 olefinically unsaturated double bonds emanating from the monomer,

the quantities of the reactants being chosen such that there are from 0.3 to 5 isocyanate groups present in the reaction mixture per hydroxyl group present.

4,107,102

HIGHLY ELASTIC POLYURETHANE FOAMS AND PROCESS FOR MAKING THEM

Manfred Dahm, Bergisch Neukirchen, and Manfred Jautelat, Burscheid-Hilgen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 646,466, Jan. 5, 1976, abandoned, which is a continuation of Ser. No. 455,706, Mar. 28, 1974, abandoned. This application May 13, 1977, Ser. No. 796,797

Int. Cl.[2] C08G *18/14, 18/32*

U.S. Cl. 521—163 **6 Claims**

1. A process for making a highly elastic polyurethane foam which comprises reacting a poly(alkylene ether) polyol which contains at least two hydroxyl groups and has a molecular weight of at least about 1500, at least 10% by weight of the hydroxyl group being primary hydroxyl groups and, a hydrazine derivative and/or hydrazine adduct having the general formula:

$$R—NH—NH—R'.(H_2O)_n$$

in which R and R'are identical or different and represent hydrogen or alkyl, cycloalkyl, aryl, aralkyl or acyl groups and $n = 0$ or 1, with an organic polyisocyanate containing distilled tolylene diisocyanate in the presence of a blowing agent, the reaction being carried out in the absence of polyether-polysiloxane blocked copolymer foam stabilizers and the resultant foam having a density of from about 18 to about 50 kg/m^3.

4,107,103

POLYURETHANES PRODUCED FROM PHOSPHORUS CONTAINING FLAME RETARDING AGENTS WHICH ARE REACTIVE WITH ISOCYANATES

Hans Hübner, Leverkusen; Johannes Blahak, Cologne, and Hans-Joachim Meiners, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

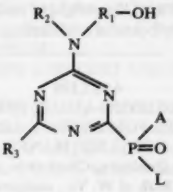
Division of Ser. No. 637,799, Dec. 4, 1975, abandoned. This application Sep. 26, 1977, Ser. No. 836,189

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1974, 2459492

Int. Cl.[2] C08G *18/32, 18/38*

U.S. Cl. 528—72 **6 Claims**

1. In a process for the production of polyurethane resins comprising reacting polyisocyanate, high molecular and/or low molecular weight polyols, and optionally other compounds containing groups which are reactive with isocyanates, the improvement which comprises using as compounds which contain groups capable of reacting with isocyanates in such a quantity that the polyurethane contains at least 0.5% by weight of phosphorus, the compounds of the general formula:

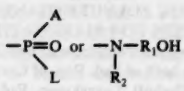


wherein

R_1 represents C_1–C_5 alkylene groups which may be branched,

R_2 represents C_1–C_3 alkyl groups which may be branched or R_1 OH and

R_3 represents C_1–C_8-alkyl, C_1–C_8-dialkylamino, C_1–C_4-oxyalkyl, C_1–C_4-thioalkyl, C_6–C_{14}-aryl or C_7–C_{15}-aralkyl groups or



and

A and L may be identical or different and represent C_1–C_{10} alkyl groups, which may be branched, benzyl groups or OR groups, wherein R represents an alkyl group, with 1–8 C atoms which may be branched, or a benzyl group.

4,107,104

HALOGENATED XYLENES

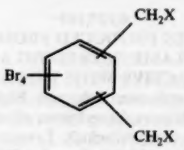
Michael Dubeck, Birmingham, and David R. Brackenridge, Royal Oak, both of Mich., assignors to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 70,922, Sep. 9, 1970, abandoned. This application May 25, 1973, Ser. No. 363,789

Int. Cl.[2] C08G *18/32, 18/14*

U.S. Cl. 521—171 **8 Claims**

1. A polyurethane foam composition produced by reaction of an organic polyisocyanate, a foaming agent and a polymer selected from the class consisting of hydroxylterminated polyethers and hydroxyl-terminated polyesters and said polyurethane foam having incorporated therein a flame retardant amount of a tetrabrominated xylene-α,α'-diol compound having the formula



wherein x is a hydroxyl radical.

4,107,105

CELLULAR UREA-FORMALDEHYDE RESIN AND METHOD OF PREPARING THE SAME

Heinz Ludwig Korf, Montreal, Canada, assignor to Rapperswill Corporation, New York, N.Y.

Filed Oct. 14, 1977, Ser. No. 841,997

Int. Cl.[2] C08J *9/30*

U.S. Cl. 521—80 **9 Claims**

1. A cellular plastic composition bounding a multiplicity of gas-filled cavities, said composition essentially consisting of urea-formaldehyde resin and at least one carbohydrate of the group consisting of glucose, fructose, maltose, and sucrose in an amount of 5 to 20% of the weight of said resin, said member being uniformly distributed in said resin.

4,107,106

PHENOL-ALDEHYDE-AMINE RESIN/GLYCOL CURATIVES FOR ENERGY ABSORBING POLYURETHANES

Raymond Augustine Dunleavy, Charleston, and Anthony Joseph Papa, St. Albans, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Nov. 22, 1976, Ser. No. 743,613

Int. Cl.[2] C08J *9/00*

U.S. Cl. 521—164 **9 Claims**

1. A process for producing a cellular polyurethane elastomer which comprises forming and curing a reaction mixture containing:

(a) a polyol,

(b) as a curative, the reaction product of:

(I) a phenol which has at least one unsubstituted reactive position on the aromatic nucleus,

(II) an aldehyde, and

(III) an aromatic amine,

(c) as a curative, an organic diol,

(d) an organic polyisocyanate in an amount that provides from 0.8 to 1.3 isocyanato groups per active-hydrogen group in the reaction mixture,

(e) a catalytic amount of catalyst for the curing of the reaction mixture to produce the elastomer, and

(f) a blowing agent in an amount sufficient to produce a cellular structure in the elastomer,

said reaction mixture containing from 99 to 30 parts by weight of (a) and from 1 to 70 parts by weight of (b) per 100 parts by weight of (a) and (b) and said reaction mixture containing from 1 to 35 parts by weight of (c) per 100 parts by weight of (a) and (c), with the proviso that the reaction mixture contains no more than 35 parts by weight of (b) and (c) per 100 parts by weight of (a), (b) and (c).

4,107,107

PROCESS FOR THE MANUFACTURE OF A FLAME RESISTANT, INSULATING, ENERGY-ABSORBING, POROUS PHENOLIC FOAM

Morris A. Mendelsohn, Wilkins Township, Allegheny County, Pa.; Girard B. Rosenblatt, Jr., Los Altos, Calif., and Joseph F. Meier, Export, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 16, 1976, Ser. No. 696,609

Int. Cl.[2] C08J *9/14*

U.S. Cl. 521—106 **13 Claims**

1. A method of making a rigid, high compressive strength phenolic resin foam, comprising the steps of:

(A) forming a premix by mixing:

(1) 200 parts by weight of at least one liquid phenolic resole resin comprising a mixture of a high viscosity phenolic resin having a viscosity at 25° C of between about 1,550 cps. to about 30,000 cps. and a low viscosity phenolic resin having a viscosity at 25° C of between about 100 cps. to about 1,500 cps., wherein the weight ratio of high viscosity phenolic resin:low viscosity phenolic resin is from about 1:0 to about 5:1,

(2) about 0.5 parts to about 5 parts by weight of a dual surfactant mixture consisting of a lipophilic surfactant and a hydrophilic surfactant, and

(3) about 8 parts to about 25 parts by weight of a fluorocarbon blowing agent to form a pre-mix, and then

(B) adding to the pre-mix about 20 parts to about 70 parts by weight of a dual acid catalyst solution comprising a sulfuric acid and phosphoric acid solution, and agitating the admixture, and then,

(C) placing the catalyzed admixture into a containing means and allowing it to solidify, to provide a rigid phenolic foam having a substantially uniform compressive strength of at least 40 psi. at between about 20% to about 50% compression, when compressed at a deflection rate of between about 2 in./min. to about 5 in./min.

4,107,108

POLYPHOSPHAZENE PLASTICIZED RESINS

Ronald L. Dieck, and Edwin J. Quinn, both of Lancaster, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

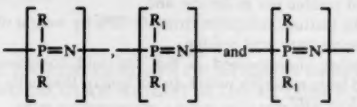
Filed Feb. 8, 1977, Ser. No. 766,780

Int. Cl.[2] C08J *9/10*

U.S. Cl. 521—85 **5 Claims**

1. A process for foaming a plasticized fire-retardant, low-smoking composition comprising

(a) a phosphazene homopolymer or copolymer comprising repeating units of the formula



where R and R_1 are the same or different and are halogen, amino, C_1 to C_{10} dialkylamino, C_1 to C_{10} alkylamino, C_6 to C_{14} arylamino, C_6 to C_{14} diarylamino, C_1 to C_{18} linear or branched alkyl, C_2 to C_{18} linear or branched alkenyl, C_1 to C_{18} alkoxy, C_6 to C_{14} aryl, C_6 to C_{14} aryloxy, substituted C_1 to C_{18} linear or branched alkyl, substituted C_2 to C_{18} linear or branched alkenyl, substituted C_1 to C_{18} alkoxy, substituted C_6 to C_{14} aryl, or substituted C_6 to C_{14} aryloxy, the substituents selected from the group consisting of chlorine, bromine, nitro, cyano, alkoxy, aryloxy, alkenyl, amino, C_1 to C_{10} alkylamino, C_1 to C_{10} dialkylamino, C_6 to C_{14} arylamino, C_6 to C_{14} diarylamino, or mixtures thereof; and

(b) from about 0.1 to about 100 parts by weight per 100 parts of said phosphazene homopolymer or copolymer of a compatible cyclophosphazene of the formula

where R and R_1 are the same as above, x is at least 3, and $y \leq 2x$; ;

which process comprises mixing the composition with a chemical blowing agent and heating the mixture to a temperature sufficient to decompose said blowing agent.

4,107,109

REACTIVE COMPOSITIONS AND POLYMERS MADE THEREFROM

Robert James Kassal, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 22, 1977, Ser. No. 780,089

Int. Cl.[2] C08C *19/28;* **C08F** *253/00, 255/04, 255/06*

U.S. Cl. 260—4 R **20 Claims**

1. A stable reactive composition useful for making graft copolymers consisting essentially of a solution of about 25–65% by weight of an uncured elastomer selected from the group consisting of ethylene/higher α-olefin copolymers; natural rubber; ethylene/ethyl acrylate copolymers; stryene butadiene rubber; ethylene/vinyl acetate copolymers; polyisobutylenes; and polychloroprene solubilized in about 35–75% by weight of polymerizable vinyl monomer capable of dissolving said elastomer and a thermally activatable free radical peroxide polymerization initiator whereupon when said reactive composition is polymerized the elastomer forms a continuous phase and the resulting vinyl polymer forms a separate and discrete phase.

2. A free flowing, particulate stable reactive composition useful for making graft copolymers consisting essentially of a solid solution of about 25–65% by weight of an uncured ethylene/higher α-olefin copolymer elastomer containing 60–80% by weight ethylene units and about 35–75% by weight of polymerizable vinyl monomer capable of dissolving in said elastomer and a thermally activatable free radical peroxide initiator whereupon when said reactive composition is polymerized the elastomer forms a continuous phase and the resulting vinyl polymer forms a separate and discrete phase.

10. A process for manufacturing a graft copolymer which consists essentially of introducing a solution of about 25–65% by weight of an uncured elastomer selected from the group consisting essentially of ethylene/higher α-olefin copolymers; natural rubber, ethylene/ethyl acrylate copolymers; styrene butadiene rubber; ethylene/vinyl acetate copolymers; polyisobutylenes; and polychloroprene, solubilized in about 35–75% by weight of a polymerizable vinyl monomer capable of dissolving said elastomer and a free radical peroxide polymerization initiator into a mold cavity and heating the solution to about 120°–180° C for about 2–40 minutes under anaerobic conditions without solvent for the reactants to obtain a graft copolymer wherein the vinyl monomer graft polymerizes on the elastomer, said elastomer being a continuous phase and the resinous vinyl polymer is a separate phase that functions as a reinforcing filler, thus resulting in a grafted copolymer having a tensile modulus in the absence of inorganic fillers of at least about 1.0 MPa at 50% elongation.

4,107,110

GRAFT COPOLYMER COATED REINFORCING AGENTS

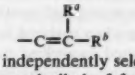
Donald R. Lachowicz, Fishkill, and Charles B. Holder, Wappinger Falls, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 526,200, Nov. 22, 1974, Pat. No. 4,065,521, which is a continuation-in-part of Ser. No. 335,858, Feb. 26, 1973, abandoned, and Ser. No. 335,857, Feb. 26, 1973, abandoned. This application Mar. 4, 1977, Ser. No. 774,282

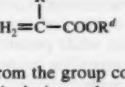
Int. Cl.[2] C08L *9/00, 23/00*

U.S. Cl. 260—17.4 CL **4 Claims**

1. A reinforcing agent coated with a graft copolymer comprising a backbone polymer having a hydrocarbon chain portion and a plurality of pendant hydrocarbon groups each containing a moiety of the formula:



wherein R^a and R^b are independently selected from the group consisting of hydrogen and alkyl of from 1 to 16 inclusive carbon atoms, having grafted thereon an acrylate of the formula:



wherein R^c is selected from the group consisting of hydrogen and alkyl of from 1 to 3 inclusive carbon atoms and R_d is alkyl of from 1 to 30 inclusive carbon atoms, to form a graft copolymer, wherein the said backbone polymer is 1,2-polybutadiene and wherein about 5 to about 80 percent by weight of the graft copolymer is 1,2-polybutadiene with the balance being the said acrylate, and wherein the said reinforcing agent is selected from the group consisting of glass fiber, asbestos fiber and alpha-cellulose.

4,107,111

POLYMER MADE OF LIGNIN, AND METHOD FOR MAKING IT

Jarl Johan Lindberg, Helsinki; Johannes Turunen, Rauma, and Bo Hortling, Helsinki, all of Finland, assignors to Rauma-Repola Oy, Rauma, Finland

Filed Feb. 21, 1975, Ser. No. 551,688

Claims priority, application Finland, Feb. 21, 1974, 518/74; Aug. 21, 1974, 750282/74

Int. Cl.[2] C07G *1/00;* **C08H** *5/02;* **C08L** *97/00*

U.S. Cl. 260—17.5 **23 Claims**

1. A method for producing a three-dimensional aromatic nuclei-containing, sulfur-containing polymer derived from lignin and exhibiting a weight loss of less than 10% when heated to 200° C for ½ hour in an inert gas, said method comprising:

heating, in a homogeneous reaction mixture, at least one lignin preparation which is a member of the group consisting of thioglycolic acid-lignin, sulfate-lignin, alkali-lignin, lignosulfonic acid, hydrolysis lignin, chlorinated lignin, ammonium-, alkali-, and alkaline-earth salts of said lignins and lignosulfonic acid, sulfite and sulfate pulp liquor from which carbohydrates have been removed, and lignin degradation products having a suitable activating substituent with

at least one member of the group consisting of sulfur and a sulfur-containing compound from the group consisting of inorganic sulfides, mercaptans, thioepoxides, thioketones, organic sulfides, disulfides, and sulfur-containing lignin degradation products or mixtures thereof, the amount of elemental sulfur or the sulfur in said sulfur-containing compound comprising from 10–200% by weight of said lignin preparation, at a temperature of about 190°–350° C, for a time sufficient to form the polymer but not longer than 20 hours, wherein the hydrogen atoms of the aromatic rings of the phenyl propane units of lignin or of the conversion products of the phenyl propane units of lignin are partially or completely substituted by thioether bonds.

4,107,112

EPOXY RESIN SOIL STABILIZING COMPOSITIONS

Laurence Latta, Jr., and John B. Leonard, Jr, both of P.O. Box 3506, Beirut, Lebanon

Filed Jul. 28, 1975, Ser. No. 599,383

Int. Cl.[2] C08L *91/00, 91/04;* **E01C** *7/30;* **E02D** *3/14*

U.S. Cl. 260—18 EP **15 Claims**

1. An epoxy resin ester-based soil stabilizing composition at a dilution sufficient to be applicable to said soil in an amount providing about 0.1 to about 1 weight percent of the epoxy resin ester in said soil, and capable of maintaining the individual particles of said soil in fixed relative positions for an extended period of time when exposed to natural environmental conditions and subjected to applied mechanical stresses, said soil stabilizing composition comprising an epoxy resin ester which is the reaction product of bisphenol A-glycidyl ether type epoxy resin with fatty acids of an oil which is a member of the group consisting of a drying oil and a semi-drying oil, water, a solvent for said reaction product and an emulsifying agent having the characteristics of providing a shelf stability of substantial duration to the soil stabilizing composition in a concentrated condition while permitting dilution with water, said soil stabilizing composition containing no more than about 10 percent free fatty acids.

4,107,113

AUTOXIDISABLE COMPOSITION

David Vincent Gibson, North Bayswater, and Bruce Leary, Frankston, both of Australia, assignors to Dulux Australia Ltd., Melbourne, Australia

Filed May 4, 1976, Ser. No. 683,243

Claims priority, application Australia, May 15, 1975, 1615/75

Int. Cl.[2] C08L *65/00*

U.S. Cl. 260—18 PF **3 Claims**

1. A liquid convertible coating composition capable of forming a solid film on a substrate, the film-forming constituent of which is a mixture consisting essentially of the following components;

(a) a component wich comprises epoxide groups and which has a maximum average molecular weight of 1200;

(b) a component which has a maximum average molecular weight of 1000 and which comprises on average at least two carboxyl groups; and

(c) a cross-linking agent which comprises at least two chemical groups per molecule which will react with hydroxyl groups,

the said components being present in the mixture in such proportions that

(1) the ratio of the total number of epoxide groups in component (a) to the total number of carboxyl groups in the mixture is from 1 : 05 to 1 : 3.0 and

(2) the total weight of components (a) plus (b) is 50–96% by weight of the mixture,

characterised in that

(i) component (a) is a compound which comprises on average one epoxide group and one autoxidisable fatty acid residue per molecule;

(ii) component (a) comprises at least one autoxidisable fatty acid residue per molecule; and

(iii) the mixture comprises from 10–70% by weight of autoxidisable fatty acid residue,

and further characterised in that the said components are selected from materials which do not boil or thermally decompose below 180° C.

4,107,114

AQUEOUS EMULSION COMPOSITIONS

Yasuharu Nakayama; Nobuhito Hirata, and Yoshio Yamashita, all of Hiratsuka, Japan, assignors to Kansai Paint Company, Limited, Amagasaki, Japan

Filed Oct. 13, 1976, Ser. No. 731,947

Claims priority, application Japan, Oct. 23, 1975, 50/127944

Int. Cl.[2] C09D *3/74, 5/02*

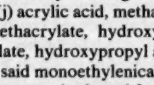
U.S. Cl. 260—22 CB **21 Claims**

1. An aqueous emulsion composition prepared by subjecting a mixture of monoethylenically unsaturated monomer and polyethylenically unsaturated monomer to emulsion polymerization with use of an emulsifier, the emulsifier being a water-soluble resin having a drying oil fatty acid residue or semi-drying oil fatty acid residue, or a water-soluble petroleum resin having non-vinyl double bonds, wherein said polyethylenically unsaturated monomer has 2 to 4 polymerizable double bonds and is at least one compound selected from the group consisting of: esters of (a) polyhydric alcohols having 2 to 4 functional groups and (b) acrylic acid or methacrylic acid; esters of (c) glycidyl acrylate or glycidyl methacrylate and (d) acrylic acid or methacrylic acid; esters of (e) polycarboxylic acids having 2 to 4 functional groups and (f) glycidyl acrylate glycidyl methacrylate, hydroxyethyl acrylate, hydroxyethyl methacrylate, hydroxypropyl acrylate or hydroxy propyl methacrylate; adducts of (g) polyepoxy compounds or polyisocyanate compounds having 2 to 4 functional groups respectively and (h) acrylic acid, methacrylic acid, hydroxyethyl acrylate, hydroxyethyl methacrylate, hydroxypropyl acrylate or hydroxy propyl methacrylate; divinylbenzene; and adducts of (i) relatively low-molecular-weight epoxy polymers having a number average molecular weight of up to 2000, or polymers containing hydroxyl, epoxy or carboxyl having the similar molecular weight as above and (j) acrylic acid, methacrylic acid, glycidyl acrylate, glycidyl methacrylate, hydroxyethyl acrylate, hydroxyethyl methacrylate, hydroxypropyl acrylate or hydroxypropyl methacrylate, said monoethylenically unsaturated monomer is at least one compound selected from the group consisting of: esters represented by the formula:

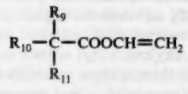
$CH_2{=}C(R_1)COOR_2$ wherein R_1 is hydrogen or CH_3, and R2 is alkyl having 1 to 26 carbon atoms:

esters represented by the formula:

$CH_2{=}C(R_1)COOR_3$ wherein R_1 is as defined above, R_3 is



$-CH_2CH(OH)CH_2OCOR_4$, $-(CH_2CH_2O)_nR_5$, $[CH_2CH(CH_3)O]\ nR_5$, $-CH_2CH(CH_3)\ OH$ or $CH_2CH_2CH_2OH$, R_4 is hydrogen or alkyl having 1 to 25 carbon atoms, R_5 is alkyl having 1 to 8 carbon atoms, and n is an integer of 1 to 8; and styrene, vinyltoluene, α-methylstyrene, methacrylonitrile, hydroxyethyl methacrylate and N-butoxymethyl acrylamide, vinyl acetate and vinyl monomers, having general formula:



(wherein R_9, R_{10} and R_{11} are alkyl and at least one of them is CH_3), and said polyethylenically unsaturated monomer is used

in an amount of about 0.1 to about 20% by weight of all the monomers used.

4,107,115

SOAPS AND ESTER-SOAPS OF α-OLEFIN DERIVED HIGH MOLECULAR WEIGHT ACIDS AS LUBRICANTS FOR THERMOPLASTIC POLYMERS

Harold C. Foulks, Jr., Newport, Ky., assignor to Emery Industries, Inc., Cincinnati, Ohio

Division of Ser. No. 535,603, Dec. 23, 1974, Pat. No. 4,029,682. This application Aug. 6, 1975, Ser. No. 602,328

Int. Cl.[2] C08K *5/09, 5/11;* **C08L** *27/06*

U.S. Cl. 260—23 XA **7 Claims**

1. A thermoplastic resin composition comprising polyvinyl chloride homopolymer or copolymer and 0.1 to 5 parts per hundred parts resin of a soap or ester-soap derived from:

(a) a mixed, straight-chain aliphatic monocarboxylic acid obtained by the ozonization of a C_{22+} α-olefin and containing less than 30% by weight acids having fewer than 21 carbon atoms, less than 20% by weight acids having greater than 35 carbon atoms and 55% by weight or more C_{21-35} acids wherein the weight ratio of odd to even carbon content acids in the C_{21-35} range is between 1.5:1 and 10:1;

(b) a metal compound wherein the metal is selected from the group consisting of alkali metals, alkaline earth metals, amphoteric metals and heavy metals and;

(c) an aliphatic hydroxylic compound having 2 to 25 carbon atoms and 1 to 10 primary or secondary hydroxyl groups;

said soaps and ester-soaps containing from about 0.1 to 15% by weight of said metal.

4,107,116

EPOXY RESIN PLASTICS

Changkiu Keith Riew, Akron; Alan R. Siebert, Maple Heights, and Eugene H. Rowe, Akron, all of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 210,156, Dec. 20, 1971, Pat. No. 3,966,837. This application Jun. 24, 1976, Ser. No. 699,218

The portion of the term of this patent subsequent to Jun. 29, 1993, has been disclaimed.

Int. Cl.[2] C08L *91/00, 63/02, 63/10*

U.S. Cl. 260—23 EP **7 Claims**

1. An epoxy resin composition yielding high strength, high modulus, high impact resistant, thermoset products, comprising a di-epoxy compound, a dicarboxylic acid functioning as a chain lengthening material, a curing agent for the epoxy compound, and a liquid elastomer with terminal functional groups reactive with epoxy groups and essentially free from other functional groups reactive with epoxy groups, the elastomer being not over about 10% of the weight of the di-epoxy compound, and the sum of the chemically equivalent quantities of the dicarboxylic acid, the functionally terminated liquid elastomer, and the curing agent, being less than the chemically equivalent quantity of the di-epoxy compound.

4,107,117

TIRE CORD IMPREGNANT

Kingso C. Lin, and Donald J. Hammond, both of Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 3, 1976, Ser. No. 747,130

Int. Cl.[2] C08L *91/00*

U.S. Cl. 260—28.5 B **10 Claims**

1. At least one glass fiber in contact with a residue produced by removing water from an aqueous composition comprising a butadiene ethoyxlated-alcohol, polycarboxylic acid anhydride half ester methacrylic acid terpolymer, a blend of emulsifiable mineral oils, silica derivatives and esters, a resorcinol-formaldehyde resin, a vinylpyridine terpolymer, a polybutadiene latex, and a wax emulsion.

4,107,118

SIZE COMPOSITION

Richard Alan McCoy, Gahanna, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Apr. 26, 1976, Ser. No. 680,312

Int. Cl.[2] C08L *63/02*

U.S. Cl. 260—29.2 EP **4 Claims**

1. An aqueous composition consisting essentially of an epoxy resin emulsion, a polyvinylpyrrolidone and a polyethylene glycol ester mono oleate.

4,107,119

ADHESIVE COMPOSITION RAPIDLY HARDENABLE AT ROOM TEMPERATURE

Akinori Kameyama; Yoshiki Matsunaga, and Hiroyasu Saito, all of Iwaki, Japan, assignors to Nippon Kasei Chemical Co., Ltd., Iwaki, Japan

Filed Feb. 15, 1977, Ser. No. 768,761

Claims priority, application Japan, Jul. 26, 1976, 51-88934

Int. Cl.[2] C08L *61/04, 61/20*

U.S. Cl. 260—29.4 UA **8 Claims**

1. An adhesive composition which comprises (a) a resinous composition produced by mixing an aromatic primary amine with an aqueous solution or emulsion containing a polymer of acrylamide or a copolymer of acrylamide and copolymerizable comonomers, and (b) formaldehyde or a formaldehyde derivative capable of liberating formaldehyde in situ, as main components.

4,107,120

HETEROPOLYMER ACRYLIC LATICES AND TEXTILES TREATED THEREWITH

Joseph E. Plamondon, Holland; William R. Wilber, Quakertown, and Stephen Goth, Southampton, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Jun. 17, 1976, Ser. No. 697,171

Int. Cl.[2] C08F *263/02*

U.S. Cl. 260—29.6 RB **7 Claims**

1. A textile treating composition consisting essentially of an acrylic latex, the particles of which comprise about 30–60% by weight of a polymeric core and about 70–40% by weight of a polymeric shell, wherein said core is formed by emulsion polymerization of a first monomer composition consisting essentially of:

(a) a major amount of a principal monomer system, and

(b) a minor amount of a crosslinking monomer system comprising:

(i) about 0.5% to 6% by weight on the total first monomer composition of a graftlinking monomer or an active crosslinking monomer, and

(ii) about 4% to 10% by weight on the total first monomer composition of a latent crosslinking monomer;

and wherein said shell is formed on said core by emulsion polymerization of a second monomer composition in the presence of said core, said second monomer composition consisting essentially of:

(a) a major amount of a principal monomer system; and

(b) about 2% to 10% on the total second monomer composition of a latent crosslinking monomer;

the monomers of said first monomer composition being selected to provide a T_g in said core of $-20°$ C. or lower, and the monomers of said second monomer composition being selected to provide a T_g in said shell of about 60° C. to about $-10°$ C.

4,107,121
IONOGENIC HYDROPHILIC WATER-INSOLUBLE GELS FROM PARTIALLY HYDROLYZED ACRYLONITRILE POLYMERS AND COPOLYMERS, AND A METHOD OF MANUFACTURING SAME

Vladimir Stoy, Prague, Czechoslovakia, assignor to Ceskoslovenska akademie ved, Czechoslovakia

Filed Nov. 20, 1975, Ser. No. 633,786

Claims priority, application Czechoslovakia, Nov. 25, 1974, 8051-74

Int. Cl.[2] C08L *33/20*

U.S. Cl. 260—29.6 AB **5 Claims**

1. Method of manufacturing ionogenic, water-insoluble, water-swelled polymers of acrylonitrile comprising:

(a) forming a homogeneous, aqueous rhodanide solution of 2–50 wt%, based on the total solution, of an acrylic polymer containing at least 80% (molar) of acrylonitrile units, together with comonomer units selected from the group consisting of arcylic acid, methacrylic acid, itaconic acid, citraconic acid, mesaconic acid, aconitic acid, fumaric acid, maleic anhydride, acrylamide, isobutyl acrylate and 2-hydroxyethyl methacrylate, said rhodanide being selected from the group consisting of lithium, sodium and calcium rhodanide and mixtures thereof and being present in an amount of 30 wt% to saturation;

(b) hydrolyzing said homogeneous solution of said polymer, the homogeneity being maintained during the whole reaction, in the presence of 0.05–7.5 wt%, based on the total solution, of a base selected from the group consisting of alkali metal hydroxides and carbonates, ammonium hydroxide, dimethyl amine and trimethyl amine at a temperature of from −15° to +130° C.; and

(c) recovering the product of hydrolysis, after having reached the desired degree of hydrolysis, by washing out said rhodanide and by washing out and/or neutralizing said base.

4,107,122
COPOLYMER PLASTICIZERS COMPRISING NOVEL ω-BROMOALKYL ESTERS OF ACYCLIC UNSATURATED DICARBOXYLIC ACIDS

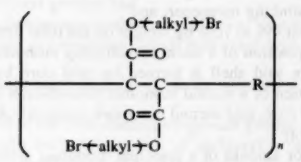
Albert W. Morgan, Collinsville, Ill.; Charles S. Shull, and William Vanderlinde, both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 642,929, Dec. 22, 1975, Pat. No. 4,058,658. This application Jun. 3, 1976, Ser. No. 692,246

Int. Cl.[2] C08F *210/00*; C08G *18/00*; C08L *23/00*; C08F *299/00*

U.S. Cl. 260—30.2 **22 Claims**

1. Composition containing a polymer and a flame retardant plasticizer comprising a copolymer of the formula



wherein R is the monomer unit derived from the polymerization of an ethylenically unsaturated comonomer having a reactivity value which, when multiplied by the reactivity value of diethyl fumarate, is less than one and *n* has a value of from about 10 to about 2,000 .

4,107,123
POLYVINYL CHLORIDE/SILICIC ACID/HEXANETRIOL MIXTURES AND PROCESS FOR THEIR PREPARATION

Willi Clas, Wesseling, and Wolfgang Büchel, Bornheim-Widdig, both of Germany, assignors to Duetsche Goldund Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 608,794, Aug. 28, 1975, abandoned, which is a continuation of Ser. No. 451,313, Mar. 14, 1974, abandoned, which is a continuation of Ser. No. 226,529, Feb. 15, 1972, abandoned. This application May 6, 1977, Ser. No. 794,679

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1971, 2107243

Int. Cl.[2] C08J *3/20*; C08K *5/05, 5/12*; C08L *27/06*

U.S. Cl. 260—31.8 G **7 Claims**

1. A process for improving the mechanical properties, heat stability and resistance to discoloration of mixtures of polyvinyl chloride and finely divided synthetic silicic acid, which comprises preparing a mixture consisting essentially of:

(A) a plasticized polyvinyl chloride;

(B) about 20 to about 100 parts by weight of a precipitated silicic acid per about 100 parts by weight of the polyvinyl chloride; and

(C) hexanetriol in an amount up to about 20 parts by weight for each 100 parts by weight of the silicic acid; wherein the precipitated silicic acid has an average particle size of about 10–100 mμ and a BET specific surface of about 30 to about 800 m^2/g and the hexanetriol is present in an amount sufficient to substantially prevent discoloration of said mixture.

4,107,124
BLOCK COPOLYMER COMPOSITIONS

Glenn R. Himes, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jan. 26, 1977, Ser. No. 762,598

Int. Cl.[2] C08K *5/01*

U.S. Cl. 260—33.6 AQ **9 Claims**

1. A polymeric composition comprising:

		Parts by Weight
(a)	a block copolymer having at least two monoalkenyl arene polymer end blocks A and at least one elastomeric conjugated diene mid block B, each block A having an average molecular weight between about 5,000 and about 125,000 and each block B having an average molecular weight between about 15,000 and about 250,000, said blocks A comprising 8–65% by weight of the copolymer;	100
(b)	a polyarene produced by the anionic polymerization of a monoalkenyl arene;	20–90
(c)	a hydrocarbon rubber extending oil; and	50–125
(d)	a finely divided filler	0–250

wherein the ratio of the number average molecular weight of the polyarene divided by the number average molecular weight of the A block of the block copolymer is between about 0.6 and about 2.0 and the Q value of the polyarene is between about 1.0 and about 3.0.

4,107,125
CROSSLINKED AROMATIC POLYIMIDES AND ARTICLES MADE THEREFROM

Elwyn Raymond Lovejoy, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 1, 1976, Ser. No. 702,356
Int. Cl.[2] C08L *77/00*
U.S. Cl. 260—37 N **12 Claims**

1. A polyimide polymeric material comprising a crosslinked chemical combination of

(a) a higher molecular weight base resin of linear aromatic polyimide polymer having at least one ketonic carbonyl per repeat unit and a molecular weight of from 3,000 to 300,000 and

(b) a lower molecular weight crosslinker resin of linear aromatic polyimide polymer having amine end-groups and a molecular weight of from 500 to 15,000; wherein the mole ratio of crosslinker resin to base resin is in a range of from greater than 2 to 40 and wherein the molecular weight ratio of higher molecular weight resin to lower molecular weight resin is from 2 to 50.

4,107,126
VINYLIC FILLER PIGMENTS AND PROCESSES FOR PRODUCING SAME

Oliver W. Burke, Jr., deceased, late of Fort Lauderdale, Fla. (by Norma Scala, administratrix), and Victor T. Humphreys, Pompano Beach, Fla., assignors to Marion Darrah and Joseph Y. Houghton, both of Pompano Beach, Fla., co-trustees

Filed Aug. 6, 1976, Ser. No. 712,160
Int. Cl.[2] C08L *61/10;* **C08F** *289/00*
U.S. Cl. 260—38 **26 Claims**

1. A process for producing an organic based pigment, which process consists essentially in

(I) combining (a) an aqueous dispersion in the form of a latex of colloidal sized vinylic filler particles as hereinafter defined, (b) an aqueous dispersion of microground water insoluble pigment as hereinafter defined, (c) from 0 to an equal weight, based on the microground pigment present, of pigment bonding agent material as hereinafter defined and (d) from 0 to an equal weight based on the microground pigment present of nitrogenous material as hereinafter defined;

said vinylic filler (a) being made up essentially of polymer particles in the colloidal size range of about 5 millimicrons to about 4 microns average diameter and being three dimentionally cross-linked to insolubility in physical solvents, said particles having been prepared by cross-linking polymerization, in aqueous dispersion, of monomer material polymerizable therein and selected from the class consisting of the polymerizable monomers containing at least one carbon-to-carbon unsaturated group with the further limitation that the selected monomer material comprises cross-linking monomer material containing a plurality of such carbon-to-carbon unsaturated groups in at least a sufficient amount to effect, in said cross-linking polymerization, enough cross-linking within the particles to render them insoluble as aforesaid;

said microground pigment (b) being selected from the class consisting of the water insoluble organic and inorganic color and leuco pigments and having been microground to an average particle size which is less than 0.5 micron and which is less than the average particle size of the vinylic filler particles;

said dispersions (a) and (b) each containing and stabilized by surface active agent material and being combined in a weight ratio, dry basis, in the range of 200:1 to 1:2 based on the vinylic filler and microground pigment material;

said bonding agent material being selected from the class consisting of (i) water soluble and dispersible aminoplasts performed and formed in situ, (ii) water soluble and dispersible phenoplasts performed and formed in situ and (iii) water soluble and dispersible organic polymers having carboxyl, amine, sulfate or sulfonic acid groups and salts thereof; and

said nitrogenous material being selected from the class consisting of (i) oleophilic amines, (ii) oleophilic imines, (iii) oleophilic amine carboxylates, (iv) the oleophilic quaternary ammonium compounds, (v) water soluble polyamines, (vi) water soluble polyimines, and (vii) combinations of two or more members of the foregoing;

(II) coagulating the combination formed in step (I) thereby affixing essentially all of said microground pigment to the surfaces of said vinylic filler particles; and

(III) recovering the resulting organic based pigment.

4,107,127
FIRE-RESISTANT SYNTHETIC RESIN COMPOSITION AND METHOD

Lawrence E. Shea, 165 Lake Dr., San Bruno, Calif. 94066

Continuation-in-part of Ser. No. 721,069, Sep. 7, 1976, abandoned, which is a continuation-in-part of Ser. No. 691,290, Jun. 1, 1976, Pat. No. 4,053,447, which is a continuation-in-part of Ser. No. 492,881, Jul. 29, 1974, abandoned. This application Apr. 29, 1977, Ser. No. 792,402
Int. Cl.[2] C08L *61/06*
U.S. Cl. 260—38 **22 Claims**

1. A tough, fire-resistive resin free from hydraulic cement, exhibiting low flame spread, good heat release and low smoke evolution when exposed to direct flame or to radiant heat and being resistant to embrittlement and cracking upon curing, comprising the reaction product reacted in the presence of water of

(a) a hydroxyl-group-providing component chosen from the group consisting of resorcinol and a mixture of resorcinol and phenol containing not over 5 mols phenol per mol resorcinol, and

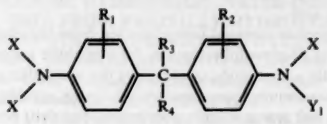
(b) an aldehyde component consisting of both formaldehyde and paraformaldehyde providing a substantially equivalent amount of aldehyde with respect to the hydroxyl groups available in said component (a), said paraformaldehyde being present in said aldehyde component in an amount of from 5.5% to 15% by weight of the total of said components (a) and (b).

4,107,128
CARBON FIBER COMPOSITION

Keizo Hosoi; Tadayoshi Endo, and Hidetosi Kanzaki, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Feb. 12, 1976, Ser. No. 657,598
Claims priority, application Japan, Feb. 20, 1975, 50-20379; Nov. 8, 1975, 50-134331; Dec. 19, 1975, 50-150651; Jan. 14, 1976, 51-2747
Int. Cl.[2] C08K *7/06, 9/04*
U.S. Cl. 260—40 R **4 Claims**

1. A carbon fiber composition comprising (i) about 90 to 99.9% by weight carbon fiber, (ii) a total of 0.1 to 10% by weight of at least one vinyl addition polymer having at least one oxirane ring, said vinyl addition polymer being prepared by polymerizing one or more ethylenic unsaturated compounds containing at least one oxirane ring or by copolymerizing said one or more ethylenic unsaturated compounds with one or more other polymerizable compounds and (iii) at least one polyfunctional epoxy compound having an epoxy equivalent of 80 through 175 and selected from the group consisting of polyfunctional epoxy compounds having the following formulae and the condensation products thereof in a compounding ratio (by weight) of said vinyl addition polymer to said polyfunctional epoxy compound of 2:98 – 98:2:

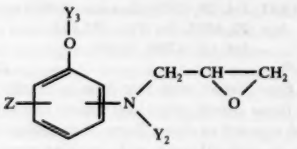


(I)

wherein X represents

Y_1 represents —H or

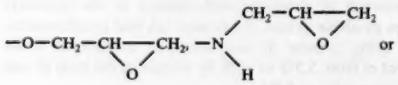
and R_1, R_2, R_3 and R_4 represent —H or —CH_3, and their condensation products, (b) compounds having the formula (II)



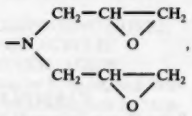
(II)

wherein Y_2 and Y_3 represent —H or

and Z represents —H, —OH,

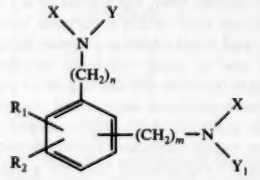


or



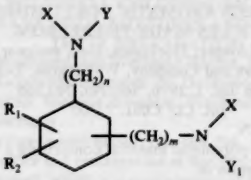
and at least three

groups are contained in the compound, and their condensation products, (c) compounds having the formula (III)



(III)

(wherein X, R_1, R_1 and R_2 are the same as defined above, and n and m represent 0 or 1), and their condensation products, (d) cycloaliphatic compounds having the formula (IV)



(IV)

(wherein X, Y_1, R_1, R_2, n and m are the same as defined above and their condensation products, (e) novolak type epoxy resins and their condensation products and (f) polyglycidyl ethers of aliphatic polyols and their condensation products.

4,107,129

ANTISTATIC ACRYLIC FIBER

Hiroyoshi Tanaka; Teruo Koseki, and Shigeru Fujii, all of Ehime-ken, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Feb. 24, 1977, Ser. No. 771,428
Claims priority, application Japan, Feb. 24, 1976, 51-18470
Int. Cl.[2] C08K *3/04*
U.S. Cl. 260—40 P **14 Claims**

1. An acrylic fiber having an electrical resistivity of about $10^8\Omega$.cm. or less, comprising (A) an acrylonitrile homopolymer or copolymer comprising at least about 80 mol% of acrylonitrile and up to about 20 mol% of at least one copolymerizable vinyl monomer and (B) an antistatic polymer which are miscible but incompatible with the acrylonitrile homopolymer or copolymer, and wherein the amount of acrylonitrile polymer (A) is about 55–98% by weight of said fiber and the amount of antistatic polymer (B) comprising polyether segments is about 2–45% by weight of said fiber, said antistatic polymer (B) having uniformly dispersed electrically conductive carbon black in an amount of about 10–200% by weight of antistatic polymer (B), and said antistatic polymer (B) extending in the form of long and slender stripes in polymer (A).

4,107,130

MULTICOMPONENT POLYOLEFIN-BLOCK COPOLYMER-POLYMER BLENDS

William P. Gergen, and Sol Davison, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 766,174, Feb. 7, 1977, which is a continuation-in-part of Ser. No. 693,463, Jun. 7, 1976, abandoned. This application Dec. 22, 1977, Ser. No. 863,384
Int. Cl.[2] C08L *67/00*; C08K *7/14*; C08L *51/00*
U.S. Cl. 260—40 R **35 Claims**

1. A composition comprising the admixture obtained by intimately mixing about 4 to about 40 parts by weight of a block copolymer, about 5 to about 48 parts by weight of at least one dissimilar engineering thermoplastic, and a polyolefin in a weight ratio of polyolefin to dissimilar engineering thermoplastic of at least 1:1, so as to form a polyblend wherein at least two of the polymers have at least partial continuous interlocked networks with each other and wherein:

(a) said block copolymer comprises at least two monoalkenyl arene/polymer end blocks A and at least one substantially completely hydrogenated conjugated diene polymer mid block B, said block copolymer having an 8 to 55 percent by weight monoalkenyl arene polymer block content, each polymer block A having an average molecular weight of between about 5,000 and about 125,000, and each polymer block B having an average molecular weight of between about 10,000 and about 300,000;

(b) said polyolefin has a molecular weight in excess of about 10,000 and an apparent crystalline melting point of between about 100° C and about 250° C; and

(c) said dissimilar engineering thermoplastic resin is capable of forming a continuous structure and is selected from the

group consisting of saturated thermoplastic polyesters and fluorinated thermoplastics wherein said thermoplastic polyester has a molecular weight in excess of about 20,000, a melting point over about 120° C and is selected from the group consisting of the condensation product of a dicarboxylic acid and a glycol, polypivalolactone and polycaprolactone.

4,107,131

MULTICOMPONENT POLYURETHANE-BLOCK COPOLYMER-POLYMER BLENDS

William P. Gergen, and Sol Davison, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 794,200, May 5, 1977, which is a continuation-in-part of Ser. No. 693,463, Jun. 7, 1976, abandoned. This application Feb. 27, 1978, Ser. No. 881,497

Int. Cl.[2] **C08L** *67/00;* **C08K** *7/14;* **C08L** *51/00*

U.S. Cl. 260—40 TN **15 Claims**

1. A composition comprising the admixture obtained by intimately mixing about 4 to about 40 parts by weight of a block copolymer, about 5 to about 48 parts by weight of at least one dissimilar engineering thermoplastic, and a thermoplastic polyurethane in a weight ratio of polyurethane to dissimilar engineering thermoplastic of greater than 1:1, so as to form a polyblend wherein at least two of the polymers have at least partial continuous interlocked networks with each other and wherein:

(a) said block copolymer comprises at least two monoalkenyl arene polymer end blocks A and at least one substantially completely hydrogenated conjugated diene polymer mid block B, said block copolymer having an 8 to 55 percent by weight monoalkenyl arene polymer block content, each polymer block A having an average molecular weight of between about 5,000 and about 125,000, and each polymer block B having an average molecular weight of between about 10,000 and about 300,000;

(b) said thermoplastic polyurethane has a generally crystalline structure, and a melting point over about 120° C; and

(c) said dissimilar engineering thermoplastic resin is capable of forming a continuous structure and is selected from the group consisting of polyamides, saturated thermoplastic polyesters, and fluorinated thermoplastics wherein said saturated polyester has a molecular weight in excess of about 20,000, a melting point over about 120° C and is selected from the group consisting of (i) the condensation product of a dicarboxylic acid and a glycol, (ii) polypivalolactone, and (iii) polycaprolactone.

4,107,132

VINYLIC FILLER PRODUCTS AND PROCESSES FOR PRODUCING SAME

Oliver W. Burke, Jr., deceased, late of Fort Lauderdale, Fla. (by Norma Scala, administratrix), and Victor T. Humphreys, Pompano Beach, Fla., assignors to Marion Darrah and Joseph Y. Houghton, Pompano Beach, Fla., Co-Trustees

Filed Aug. 6, 1976, Ser. No. 712,213

Int. Cl.[2] **C08F** *6/00, 6/14, 6/24*

U.S. Cl. 260—42.14 **8 Claims**

1. A process for producing a soft, readily dispersible dry vinylic filler product, which process consists essentially in

(a) providing an aqueous dispersion containing a dispersing agent and an aqueously wet, never previously dried vinylic filler material, said vinylic filler material consisting essentially of spheruloidal organic polymer material that is three dimensionally cross-linked to essential insolubility in any physical solvent and that has primary particles in the colloidal size range of about 5 millimicrons to not more than 4.0 microns average diameter, said spheruloidal particles having on the surfaces thereof from 0 to an equal weight based on the spheruloids, of an insoluble coloring component, said coloring component, when present, comprising organic and/or inorganic material at least in part precipitated in insoluble form onto said surfaces from water soluble precursor material thereof in aqueous solution,

(b) treating the dispersion provided in step (a) with a sufficient amount, in the range of from 0.5 to 35% by weight, based on the vinylic filler material present, of an agent selected from the class consisting of the aliphatic, cycloaliphatic and aromatic hydrocarbons and alcohols having boiling points between 90° C. and 200° C., and mixtures thereof, for a sufficient time in the range of 5 minutes to 5 hours, and at a sufficient nonboiling temperature in the range of 25° C. to 100° C. to effect conditioning of said vinylic filler material so that it will not form hard aggregates on drying, and

(c) thereafter drying the so treated material thereby forming the soft, readily dispersible vinylic filler product.

6. A soft, readily dispersible dry vinylic filler product, which product essentially comprises

(a) vinylic filler material consisting of spheruloidal organic polymer material three dimensionally cross-linked to essential insolubility in any physical solvent and having primary particles in the colloidal size range of about 5 millimicrons to not more than 4.0 microns average diameter, said spheruloidal particles having on the surfaces thereof from 0 to an equal weight based on the spheruloids, of an insoluble coloring component, said coloring component, when present, comprising organic and/or inorganic material at least in part precipitated in insoluble form onto said surfaces from water soluble precursor material thereof in aqueous solution,

(b) said vinylic filler material having been treated in aqueous medium without previously having been dried with from 0.5 to 35% by weight, based on the vinylic filler material present, of an agent selected from the class of aliphatic, cycloaliphatic and aromatic hydrocarbons and alcohols having boiling points between 90° C. and 200° C., and mixtures thereof and having thereafter been subjected to drying.

4,107,133

COLORED POLYETHYLENE MOLDING COMPOSITIONS

Hideo Sawai, Takatsuki; Satoshi Hirabayashi, Nagaokakyo, and Shigezi Sato, Nishinomiya, all of Japan, assignors to Dainippon Ink & Chemicals, Inc., Tokyo, Japan

Filed Jan. 3, 1975, Ser. No. 538,388

Claims priority, application Japan, Jan. 14, 1974, 49-7228; Dec. 23, 1974, 49-146848

Int. Cl.[2] **C08K** *5/04, 5/08, 9/00;* **C08L** *23/06*

U.S. Cl. 260—42.15 **6 Claims**

3. A moldable polyethylene capable of being molded into colored shaped articles with reduced deformation and shrinkage comprising (A) a medium or low pressure, high density polyethylene having a melt index of no more than 50 and a density of at least 0.94 g/cm^3 and (B) a coloring composition which comprises (I) 100 parts by weight of an organic pigment selected from the group consisting of Isoindolinone Yellow (Pigment Yellow 109), Cyanine Green (Pigment Green 7), Azo Yellow (Pigment Yellow 83), Perylene Red (Pigment Red 178), Perinone Orange (Pigment Orange 43), Anthraquinone Yellow (Pigment Yellow 108), Isoindolinone Yellow (Pigment Yellow 110), Isoindolinone Red (Pigment Red 180), Dioxazine Violet (Pigment Violet 23), Azo Red (Pigment Red 166), Quinacridone Red (Pigment Violet 19), Isoindolinone Orange (Pigment Orange 42), and Cyanine Blue (Pigment Blue 15) and (II) from about 10 to about 30 parts by weight of an organosilane compound selected from the group consisting of γ-aminopropyltriethyoxysilane, γ-aminopropyltrimethoxysilane, β-aminoethyltributoxysilane; N-γ-(aminopropyl)γ-aminopropyltriethoxysilane and N-β-(aminoethyl)-γ-aminopropyltrimethoxysilane.

5. A moldable polyethylene capable of being molded into colored shaped articles with reduced deformation and shrinkage comprising (A) a medium or low pressure, high density

polyethylene having a melt index of no more than 50 and a density of at least 0.94 g/cm^3 and (B) a coloring composition which comprises (I) 100 parts by weight of an organic pigment selected from the group consisting of Isoindolinone Yellow (Pigment Yellow 109), Cyanine Green (Pigment Green 7), Azo Yellow (Pigment Yellow 83), Perylene Red (Pigment Red 178), Perinone Orange (Pigment Orange 43), Anthraquinone Yellow (Pigment Yellow 108), Isoindolinone Yellow (Pigment Yellow 110), Isoindolinone Red (Pigment Red 180), Dioxazine Violet (Pigment Violet 23), Azo Red (Pigment Red 166), Quinacridone Red (Pigment Violet 19), Isoindolinone Orange (Pigment Orange 42), and Cyanine Blue (Pigment Blue 15) and (II) from about 10 to about 30 parts by weight of an organotitanium compound selected from the group consisting of tetra-iso-propyl titanate, hydroxy titanium oleate, diisopropoxy titanium bistriethanolamine, tetra-n-propyl titanate, tetrabutyl titanate, and diisopropoxy titanium bisacetylacetone.

4,107,134

POLYBUTADIENE COMPOSITIONS CONTAINING REINFORCING GLASS MICROSPHERES AND CARBON FIBERS

Francois Dawans, Bougival, France, assignor to Institut Francais Du Petrole, Rueil-Malmaison, France

Filed Oct. 27, 1976, Ser. No. 736,348
Claims priority, application France, Oct. 31, 1975, 75 33600
Int. Cl.^{2} C08K *7/06*
U.S. Cl. 260—42.17 **8 Claims**

1. A low density resin composition resulting from curing, in the presence of a sufficient cross-linking amount of at least one free-radical generator, a resin which comprises a polybutadiene containing from 50 to 80% of 1,2 units and having a number average molecular weight lower than 100,000, and at least one liquid vinyl monomer in a proportion of 0 - 150 parts by weight per 100 parts by weight of said polybutadiene, and incorporated in 100 parts by weight of said resin (a) 20–50 parts by weight glass hollow microspheres having a diameter of from 10 to 300 microns, and (b) 1–10 parts by weight of carbon fibers of a length of from 0.25 to 10 mm.

4,107,135

DECORATIVE POLYMERIC ARTICLE CONTAINING FLOCK FIBERS

Ray B. Duggins, Chadds Ford, Pa., and Richard V. Westerman, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 23, 1976, Ser. No. 679,906
Int. Cl.^{2} C08K *7/02*
U.S. Cl. 260—42.37 **16 Claims**

1. A dappled article consisting essentially of:
(A) 20–70 parts by weight of a crosslinked polymer having a glass transition temperature of at least 70° C;
(B) 80–30 parts by weight of an inert filler; and
(C) 0.01–2 percent by weight of the article, of short, colored fibers having a length of approximately 10–500 mils and a denier of about 1–300.

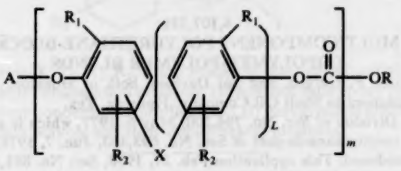
4,107,136

SYNTHETIC RESIN STABILIZER COMPRISING AN ORGANIC PHOSPHITE AND A CARBONATE

Motonobu Minagawa, Kosigaya; Yutaka Nakahara, Iwatsuki, and Tohru Haruna, Okegawa, all of Japan, assignors to Argus Chemical Corporation, Brooklyn, N.Y.

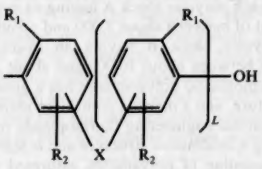
Filed Oct. 6, 1976, Ser. No. 729,975
Claims priority, application Japan, Oct. 6, 1975, 50-120393
Int. Cl.^{2} C08K *5/52*
U.S. Cl. 260—45.95 C **19 Claims**

1. A stabilizer composition useful in synergistically increasing the resistance of a synthetic resin to deterioration when heated at 150° C, comprising in combination (a) at least one organic phosphite having linked to phosphorus through oxygen at least two alkyl groups having from 6 to 20 carbon atoms and at least one organic group selected from polycyclic polyhydric phenol groups and pentaerythritol groups and (b) at least one carbonate ester of an orthosubstituted polyhydric phenol having an average molecular weight between 400 and 4000 and having the formula:

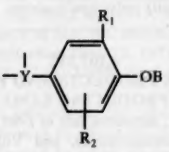


in which independently at each occurrence R_1 is selected from the group consisting of alkyl, cycloalkyl, and aralkyl radicals, R_2 is selected from the group consisting of hydrogen and R_1, A is selected from the group consisting of hydrogen and

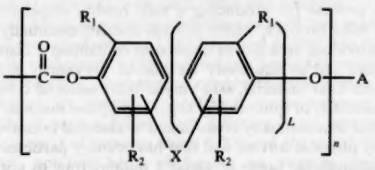
R is selected from the group consisting of alkyl, aryl, alkaryl, aralkyl, cycloalkyl and



Groups, X is selected from the group consisting of —CH_2SC-H_2—,and



where Y is a hydrocarbon radical, B is



L is 0 or 1, *m* is 1 to about 20, and *n* is an average of 0.1 to about 20.

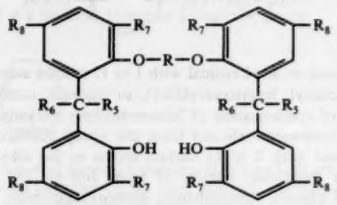
15. A stabilized synthetic resin composition comprising a synthetic resin and a stabilizing amount of a stabilizer composition according to claim 1.

4,107,137
PHENOLIC ANTIOXIDANTS FOR SYNTHETIC POLYMERS

Yves Proux, and Christian Julien, both of Paris, France, assignors to Societe Francaise d'Organo Synthese, Gennevilliers, France

Continuation-in-part of Ser. No. 557,680, Mar. 12, 1975, abandoned. This application Dec. 23, 1976, Ser. No. 754,019
Claims priority, application France, Mar. 12, 1974, 74 08403
Int. Cl.[2] C08K *5/41, 5/13;* **C07C** *69/78, 141/00*
U.S. Cl. 260—45.85 T **10 Claims**

1. A compound of the formula:

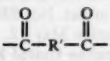


wherein:

R_5 and R_6 are hydrogen or alkyl groups

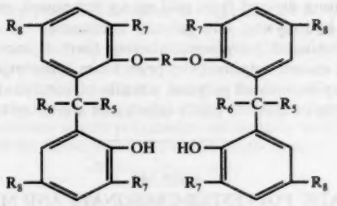
R_7 and R_8 are alkyl groups

R is an acid group derived from the group consisting of thionyl chloride, phthalic acid and



wherein R′ is an aliphatic group having from 1 to 7 carbon atoms.

5. A synthetic polymer containing a stabilizing amount of from 0.01 to 0.5% by weight of a compound having the formula:



wherein:

R_5 and R_6 are hydrogen or alkyl groups

R_7 and R_8 are alkyl groups

R is an acid group derived from the group consisting of thionyl chloride, phthalic acid and

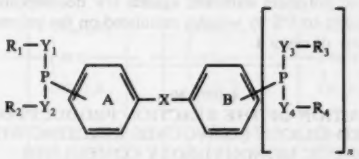
wherein R′ is an aliphatic group having from 1 to 7 carbon atoms.

4,107,138
PHOSPHONOUS AND THIOPHOSPHONOUS ACID ETHERS AS STABILIZERS FOR ORGANIC MATERIALS

Kurt Hofer, Münchenstein, and Guenther Tscheulin, Riehen, both of Switzerland, assignors to Sandoz Ltd., Basle, Switzerland

Division of Ser. No. 455,597, Mar. 28, 1974, Pat. No. 3,903,208, Continuation-in-part of Ser. No. 308,594, Nov. 21, 1972, Pat. No. 3,875,264. This application May 8, 1975, Ser. No. 575,524
Claims priority, application Switzerland, Nov. 24, 1971, 17129/71
Int. Cl.[2] C08K *5/49, 5/53*
U.S. Cl. 260—45.7 P **12 Claims**

1. A composition comprising an organic material which is susceptible to degradation by light, oxygen and/or heat and an amount effective to stabilize said material against said degradation of a compound of formula I



I

in which

n is 0 or 1,

X is $—CH_2—$, —O—, or —S—,

Y_1, Y_2, Y_3 and Y_4, which may be the same or different, each is —O—, or —S—,

R_1, R_2, R_3 and R_4, which may be the same or different, each is hydrogen or a hydrocarbon radical of up to 20 carbon atoms consisting of aromatic and/or saturated aliphatic and/or cycloalkyl units,

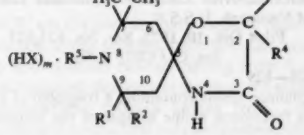
and rings A and B may be either further unsubstituted or each further substituted by 1 or 2 alkyl groups of 1 to 6 carbon atoms with the proviso that when Y_1 and Y_2 are oxygen and n is zero X is oxygen or sulfur.

4,107,139
1-OXA-4,8-DIAZASPIRO[4,5]DECANES AND POLYMERS STABILIZED AGAINST UV LIGHT WITH THESE COMPOUNDS

Norbert Mayer, Gersthofen; Gerhard Pfahler, Augsburg, and Hartmut Wiezer, Gersthofen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 9, 1977, Ser. No. 823,145
Int. Cl.[2] C07D *498/10;* **C08K** *5/35*
U.S. Cl. 260—45.8 NZ **9 Claims**

1. Compounds of the general formula



in which

R^1 and R^2 are the same or different, straight-chained or branched alkyl radicals having 1 to 12 carbon atoms, or R^1 and R^2, together with the carbon atom to which they are bonded, form an optionally methyl-substituted cyclopentyl, cyclohexyl or 2,2,6,6-tetramethylpiperidyl ring, of which the carbon atom 4 is identical to the carbon atom 9 of the spiro system,

R^3 and R^4 are the same or different and represent hydrogen

atoms, alkyl radicals or isoalkyl radicals having 1 to 30 carbon atoms, or represent aryl radicals having 6 or 10 carbon atoms optionally substituted by a halogen atom or by an alkyl radical having 1 to 4 carbon atoms, or aralkyl radicals having 7 to 10 carbon atoms, or R^3 and R^4 together with the carbon atom to which they are bonded, form a cycloalkyl group having 4 to 20 carbon atoms, which may be substituted by C_1 to C_4 alkyl groups, or an optionally alkyl-substituted pyrrolidine or piperidine group the ring nitrogen atom of which cannot be in the α-position to the spiro atom,

R^5 represents a hydrogen atom, an oxygen atom, a hydroxyl group or an alkyl group having 1 to 4 carbon atoms, and

HX represents a non-oxidizing mineral acid, an aliphatic or aromatic sulfonic or phosphonic acid, an aliphatic mono-, di- or polycarboxylic acid or an aromatic mono- or dicarboxylic acid and $m = 0$ or 1 but when $> N—R^5$ does not have a basic reaction, is always 0.

9. Organic polymers stabilized against UV decomposition, containing 0.01 to 5% by weight, calculated on the polymers, of a stabilizer of claim 1.

4,107,140
PRODUCTION OF THE REACTION PRODUCTS OF OXIDATED SILICON COMPOUNDS REACTING WITH ORGANIC MONOHYDROXY COMPOUNDS

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Continuation-in-part of Ser. No. 765,050, Feb. 2, 1977, Pat. No. 4,089,883, which is a continuation-in-part of Ser. No. 703,925, Jul. 9, 1976, abandoned, and Ser. No. 589,626, Jun. 23, 1975, abandoned. This application Nov. 25, 1977, Ser. No. 854,843

Int. Cl.[2] C08G *77/04*

U.S. Cl. 521—154 **20 Claims**

1. The process for the production of the reaction products oxidated silicon compounds with an organic monohydroxy compound by the following steps:

(a) mixing about 1 part by weight of an oxidated silicon compound with 1 to 3 parts by weight of an organic monohydroxy compound;

(b) adding an alkali catalyst in the amount of 1% to 10% by weight, percentage based on the weight of the oxidated silicon compound;

(c) heating said mixture to just below the boiling temperature of the monohydroxy compound while agitating at ambient to 60 psig of pressure for 20 to 60 minutes, thereby

(d) producing an organic silicate compound.

4,107,141
METHOD OF PREPARING PHENOLAMINE RESINS

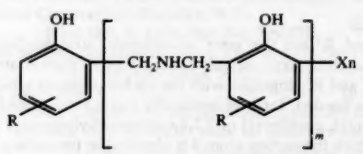
Vladimir Vasilievich Moiseev, Leninsky prospekt, 63, kv. 12; Vladimir Vasilievich Kosovtsev, Leninsky prospekt, 13, kv. 13; Galina Prokofievna Kolesnikova, ulitsa Karla Marxa, 92, kv. 23; Tamara Ivanovna Esina, prospekt Patriotov, 30, kv. 38; Alexandr Nikolaevich Polukhin, ulitsa Gomelskaya, 5, and Viktor Alexandrovich Zimnukhov, ploschad Lenina, 15, kv. 44, all of Voronezh, U.S.S.R.

Filed Oct. 10, 1975, Ser. No. 621,627

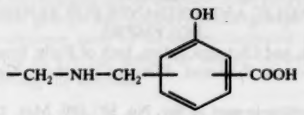
Int. Cl.[2] C08F *2/00*

U.S. Cl. 528—129 **4 Claims**

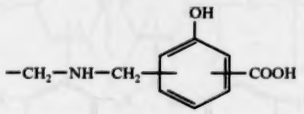
1. Phenolamine resins containing a fragment of a substituted phenol and methylene amine bridges of the formula:



where X is H or



m and *n* are of from 1 to 20; when X is H, R represents an alkyl radical with 5 to 12 carbon atoms, phenylethyl, cumyl, hydroxyarylalkyl, carboxy; when X is



R represents an alkyl radical with 1 to 12 carbon atoms, phenylethyl, cumyl, hydroxyarylalkyl, or carboxy comprising a product of condensation of hexamethylene tetramine with a phenol component selected from the group consisting of an alkylphenol with 5 to 12 carbon atoms in the alkyl radical having a molecular weight of from 160 to 350, styrene-alkylated phenol, cumylphenol, diphenylolpropane, hydroxybenzoic acid and mixtures thereof.

4,107,142
EPOXIDE MATERIALS

Anthony Vernon Cunliffe, Datchworth, England; Peter John Pearce, Innisfail, Australia, and David Hugh Richards, Bishops Stortford, England, assignors to National Research Development Corporation, London, England

Continuation-in-part of Ser. No. 523,528, Nov. 13, 1974, abandoned. This application May 12, 1976, Ser. No. 685,674

Claims priority, application United Kingdom, Nov. 14, 1973, 52910/73

Int. Cl.[2] C08G *67/00*; C08K *5/15*; C08F *24/00*

U.S. Cl. 528—93 **17 Claims**

1. A process for the production of an epoxide material comprising reacting, under substantially anhydrous conditions in a polar aprotic solvent, a conjugated diene with an electron donor in the presence of an epoxy compound containing at least two epoxide groups to form an anionic intermediate consisting essentially of a polydiene chain having terminal epoxy group derived from said epoxy compound, and subsequently hydrolysing said anionic intermediate to form an epoxy-terminated polydiene, wherein there is incorporated into said anionic intermediate, prior to its hydrolysis to form said epoxy-terminated polymer, a nitrile-substituted alkene in a molar ratio of diene to nitrile-substituted alkene up to 10:1.

4,107,143
AROMATIC POLYESTER CARBONATE AND METHOD FOR PRODUCING THE SAME

Hiroo Inata; Tsuto Morinaga, both of Hino; Takatoshi Kuratsuji, Matsuyama; Takanori Urasaki, and Shoji Kawase, both of Iwakuni, all of Japan, assignors to Teijin Limited, Osaka, Japan and Teyin Limited, Osaka, Japan

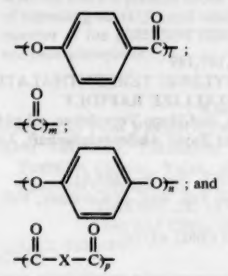
Filed Feb. 3, 1977, Ser. No. 765,333

Claims priority, application Japan, Feb. 12, 1976, 51-13257; Feb. 13, 1976, 51-13905; Mar. 1, 1976, 51-21078; Sep. 3, 1976, 51-104918

Int. Cl.[2] C08G *63/62*

U.S. Cl. 528—176 **14 Claims**

1. Aromatic polyester carbonate in a substantially linear structure having an inherent viscosity of 0.5 and above, and consisting essentially of bonding units to be represented by the following general formulas:



where: X is a divalent aromatic group; the group

and —X— in said general formulas (a), (c), and (d) are substantially bonded together by the ester bonding and the carbonate bonding; and said bonding units are mutually bonded under the following equational relationship:

$$0.75 \geqq l/(l+m+p) \geqq 0.6;$$

$$0.4 \geqq m/(l+m+p) \geqq 0.05;$$

$$0.35 \geqq p/(l+m+p) \geqq 0;$$

and

$$1.1 \geqq n/(m+p) \geqq 0.9.$$

4,107,144
PHENOLIC ANTIOXIDANTS WITH POLYMER TAILS

Kenneth E. Russell, and Linda G. M. C. Vail, both of Kingston, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Apr. 15, 1977, Ser. No. 787,935
Claims priority, application Canada, May 20, 1976, 252939
Int. Cl.[2] C08F *232/00*; C08L *9/06*; C08F *8/02*; C08L *4/00*
U.S. Cl. 526—212 **22 Claims**

1. A dialkylphenol antioxidant having attached to the phenol in the 4 or 6 position on the ring a vinylic polymer tail of molecular weight from about 1000 to about 5000 as determined by vapor pressure osmometry or by gel permeation chromatography, said vinylic polymer being in the form of a pendant chain attached to said ring at one end of the chain derived from vinyl monomers which polymerize cationically with an acid catalyst of the Lewis Acid or Friedel-Crafts type.

4,107,145
SALTS OF BENZENEPHOSPHONIC ACID AND MELAMINE AS REACTIVE ADDITIVES TO FLAMMABLE EPOXY MONOMERS TO REDUCE FLAMMABILITY OF THE CURED REACTION PRODUCTS

Eli Simon, 7175 Little Harbor Dr., Huntington Beach, Calif. 92648

Division of Ser. No. 663,446, Mar. 3, 1976, Pat. No. 4,061,605. This application Aug. 23, 1977, Ser. No. 820,810
Int. Cl.[2] C08L *63/00*
U.S. Cl. 528—108 **3 Claims**

1. Cured reaction products having reduced flammability prepared by reacting polyfunctional epoxy monomers with benzenephosphonic acid-melamine salts, said salts being prepared by reacting benzenephosphonic acid with melamine in a mol ratio of benzenephosphonic acid to melamine of from

(a) 1-mol of benzenephosphonic acid : 2-mols of melamine to 2-mols of benzenephosphonic acid : 3-mols of melamine.

(b)

(c)

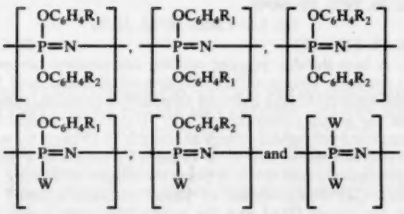
(d)

4,107,146
CURABLE ARYLOXYPHOSPHAZENE POLYMERS

Ronald L. Dieck; Alan B. Magnusson, and Edwin J. Quinn, all of Lancaster, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Feb. 14, 1977, Ser. No. 768,603
Int. Cl.[2] C08G *79/04*; C08J *9/10*
U.S. Cl. 528—168 **7 Claims**

1. A cured phosphazene copolymer prepared by heating in admixture with a sulfur-type curing agent a copolymer having randomly distributed repeating units represented by the formulas



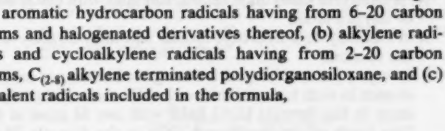
wherein R_1 is C_1 to C_{10} linear or branched alkoxy, R_2 is hydrogen, C_1–C_{10} linear or branched alkyl or halogen, and W represents a monovalent radical containing a group capable of a crosslinking chemical reaction at moderate temperatures, said group being attached to a P atom by a —O— linkage.

4,107,147
POLYSULFONEIMIDES

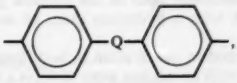
Frank J. Williams, III, Scotia, and Paul E. Donahue, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 2, 1977, Ser. No. 830,114
Int. Cl.[2] C08G *73/10*
U.S. Cl. 528—172 **7 Claims**

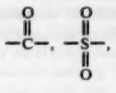
1. A polysulfoneimide consisting essentially of units of the formula



where R and R′ are divalent aromatic organic radicals having from 6–20 carbon atoms selected from the class consisting of (a) aromatic hydrocarbon radicals having from 6–20 carbon atoms and halogenated derivatives thereof, (b) alkylene radicals and cycloalkylene radicals having from 2–20 carbon atoms, $C_{(2-8)}$ alkylene terminated polydiorganosiloxane, and (c) divalent radicals included in the formula,



where Q is a member selected from the class consisting of divalent radicals of the formulas $-C_yH_{2y}-$,



—O—, and —S—, and *y* is a whole number from 1 to 5, inclusive.

4,107,148

POWDER COATING COMPOSITION COMPRISING A MIXTURE OF A POLYESTER AND PLURAL SILICONE COMPOUNDS

Kanji Fujiyoshi; Minoru Fukuda; Yutaka Mizumura; Junji Sono, and Iori Naito, all of Otsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Aug. 20, 1975, Ser. No. 606,022

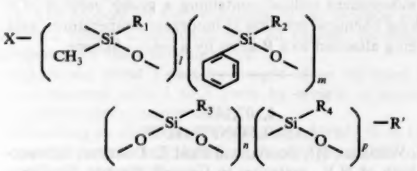
Claims priority, application Japan, Aug. 22, 1974, 49-96851; Jun. 20, 1975, 50-76049

Int. Cl.[2] C08G *18/42, 18/61*

U.S. Cl. 528—273 **23 Claims**

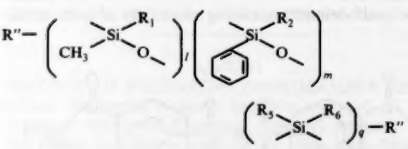
1. A heat durable powder coating composition comprising 100 parts by weight of an ethylene-terephthalic acid based copolyester [I] having hydroxy terminals, a coreactant selected from the group consisting of 2 to 10 parts by weight of an alkoxylated polyamine-aldehyde resin; 3 to 15 parts by weight of a polyanhydride; and 10 to 70 parts by weight of a blocked polyisocyanate and 0.1 to 5 parts by weight of silicone compounds [II] which consist of plural members selected from both the group [IIA] and the group [IIB]; the group [IIA] consisting of the silicone compounds conforming to the following formula,

[IIA]



and the group [IIB] consisting of the silicone compounds conforming to the following formula,

[IIB]



wherein,

R_1, R_2, R_3, R_4, R_5, R_6 are methyl or phenyl radicals;

R′ is a hydrogen atom or methyl radical and links with the oxygen atom;

R″ is methyl or other alkyl radical and links with the Si atom or oxygen atom;

X is methoxy or a hydroxyl radical and links directly with the Si atom;

l, m, n, p, q are zero or positive integers, but are not zero all at once in each formula; the mark —O— attached to the Si atom in the formula [IIA] links with any Si atom in the four kinds of organosiloxane units in the formula [IIA], otherwise, terminates with a hydrogen atom or methyl radical;

the bond mark — attached to the Si atom in both formulas [IIA] and [IIB] links with an oxygen atom to form a siloxane bond; and

the mark —O— attached to the Si atom in the formula [IIB] links with any Si atom in the three kinds of organosiloxane units in the formula [IIB] or terminates with the R″ radical.

4,107,149

POLY(ETHYLENE/ALKYLENE) TEREPHTHALATES WHICH CRYSTALLIZE RAPIDLY

Peter Bier; Rudolph Binsack, and Hugo Vernaleken, all of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 17, 1976, Ser. No. 658,817

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1975, 2507776

Int. Cl.[2] C08G *63/16*

U.S. Cl. 528—309 **14 Claims**

1. A highly crystalline, thermoplastic terephthalic acid copolyester which crystallizes rapidly, said copolyester consisting of a dicarboxylic acid component, at least 90 mol %, based on the dicarboxylic acid component, of said dicarboxylic acid component being condensed terephthalic acid radicals, and 90 and 99.5 mol %, based on the diol component, of said diol component being condensed ethylene glycol radicals and 0.5 to 10 mol %, based on the diol component, thereof being condensed radicals of a member selected from the group consisting of hexane-2,5-diol, 2,2,4-trimethylpentane-1,3-diol, and 2-methylpentane-2,4-diol.

5. A process for the production of thermoplastic terephthalic acid copolyesters which crystallize more rapidly than polyethylene terephthalate homopolymer comprising

(1) esterifying or transesterifying an acid component consisting of

(a) at least 90 mol % of terephthalic acid and dimethyl terephthalic acid ester, and

(b) up to 10 mol % of other aliphatic and aromatic dicarboxylic acids and acid esters with

(2) 1.05 to 2.40 equivalents of a diol component consisting of

(a) 90 to 99.5 mol % of ethylene glycol, and

(b) 10 to 0.5 mol % of a codiol selected from the group consisting of hexane-2,5-diol; 2,2,4 trimethyl pentane-1,3-diol; and 2-methyl pentane-2,4-diol at

(3) a temperature of between 150° and 250° C in the presence of esterification or transesterification catalysts, and

(4) polycondensing the initial reaction products at a temperature between 200° and 300° C under reduced pressure in the presence of an esterification catalyst,

wherein the codiol is added to the reaction mixture after substantially all of the acid component has been reacted to di(2-hydroxyethyl)ester.

4,107,150

HIGH IMPACT TEREPHTHALATE COPOLYESTERS USING 1,4-BUTANEDIOL AND 1,4-CYCLOHEXANEDIMETHANOL

Robert W. Campbell, and James W. Cleary, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

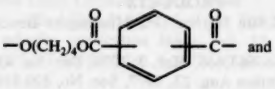
Filed May 27, 1976, Ser. No. 690,809

Int. Cl.[2] C08G *63/12*

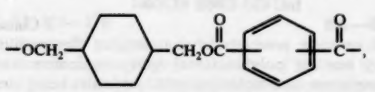
U.S. Cl. 528—307 **4 Claims**

1. A copolyester consisting essentially of repeating units having the structures

(A)



(B)



wherein there is present about 3 to about 40 percent by number of repeating units (B) and wherein about 80 to 100 percent by number of the phenylene radicals in all of the repeating units are para-phenylene.

4,107,151

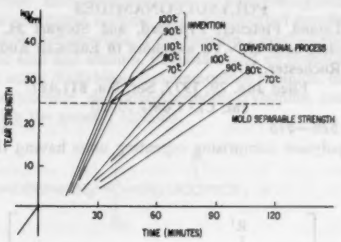
PROCESS FOR PRODUCING URETHANE ELASTOMER

Akio Takahashi, Yokohama; Hirokichi Saito, Shimizu, and Yoshijiro Oyaizu, Yaizu, all of Japan, assignors to Ihara Chemical Company Co., Ltd., Tokyo, Japan

Filed Oct. 28, 1976, Ser. No. 736,346

Int. Cl.[2] C08G *18/65, 18/14, 18/16*

U.S. Cl. 528—54 **13 Claims**



1. A process for producing a urethane elastomer which comprises reacting

an organic polyisocyanate with a mixture of

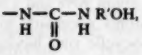
component (1) which is a long chain polyol having a molecular weight within the range of 400 to 5,000 and characterized as composed of terminal alcoholic hydroxyl groups attached to a moiety which is hydrocarbon or hydrocarbon interrupted by carboxylic ester or ether linkages,

a component (2) which is an aromatic diamine, and

a component (3) which is in an ungelled state and which is at least one of (a) a polyol having at least one urethane bond or at least one urethane bond and urea bond and (b) an amino alcohol having at least one urethane bond and a urea bond,

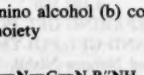
wherein at least one urethane bond of each of the components (a) and (b) is attached through the chain oxygen of said urethane bond to a group — GOH of a molecular weight such that HOGOH is of molecular weight not greater than 2000 wherein G is a divalent hydrocarbon moiety of a divalent hydrocarbon moiety interrupted by ester or ether linkages and wherein said G is otherwise unsubstituted or is substituted by alcoholic OH,

wherein the polyol (a) containing a urea bond contains it in a moiety



R′ being a low molecular weight divalent hydrocarbon radical

and wherein the amino alcohol (b) containing a urea bond contains it in a moiety



R″ being a divalent radical which is attached to the indicated nitrogen atoms at carbon, which is not reactive with —NCO, and which contains up to 9 carbon atoms and each carbon of R″ is attached to another carbon of R″,

all valences of the urethane and urea bonds in said (a) and (b) not above specified being attached to carbon atoms of organic radicals not reactive with —NCO, or said last mentioned radicals interrupted by at least one urethane linkage and constituting the balance of the molecule of each of (a) and (b),

there being a ratio of 5–40 mol % of the component (3) to the total of component (1) and component (3), and there being 0.90 – 1.30 equivalent of organic polyisocyanate per total of —NH_2 and —OH groups in components (1), (2) and (3).

4,107,152

POLYURETHANES PRODUCED FROM PHOSPHORUS CONTAINING FLAME RETARDING AGENTS WHICH ARE REACTIVE WITH ISOCYANATES

Hans Hübner, Leverkusen; Johannes Blahak, Cologne, and Hans-Joachim Meiners, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

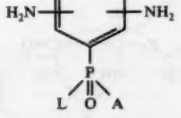
Division of Ser. No. 637,630, Dec. 4, 1975, Pat. No. 4,061,697. This application Sep. 1, 1977, Ser. No. 829,833

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1974, 2459491

Int. Cl.[2] C08G *18/32*

U.S. Cl. 528—68 **6 Claims**

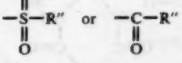
1. In a process for the preparation of polyurethanes comprising reacting polyisocyanates, high molecular weight and/or low molecular weight polyols and other organic compounds which contain groups capable of reacting with isocyanates, the improvement wherein the compounds which are reactive with isocyanate groups, include compounds of the following formula, used in an amount such that the polyurethane contains at least 0.5% by weight of phosphorous:



wherein

A and L, which are identical or different, represent optionally branched C_1–C_{17} alkyl group or -OR group wherein R represents an optionally branched C_1–C_8-alkyl group, and

X represents hydrogen, halogen, an optionally branched C_1-C_8 alkyl group, a C_6-C_{12} aryl or aralkyl groups, NH_2, CF_3, CN, COOR′, SO_3R',



wherein:

R′ represents hydrogen or an optionally branched alkyl or cycloalkyl group having 1–10 C atoms and

R″ represents an optionally branched alkyl or cycloalkyl group having 1–10 C atoms.

4,107,153

HEAT-RESISTANT THERMOSETTING POLYIMIDE RESIN

Keiichi Akiyama, Yokosuka; Junichi Kamiuchi, Yokohama; Itsuo Matsuda, Chofu, and Takara Fujii, Yokohama, all of Japan, assignors to Toshiba Chemical Products Co., Ltd., Tokyo, Japan

Filed Sep. 23, 1975, Ser. No. 615,933

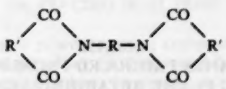
Claims priority, application Japan, Sep. 25, 1974, 49/109505; Mar. 6, 1975, 50/27292; Mar. 6, 1975, 50/27293

Int. Cl.[2] C08G *69/26*

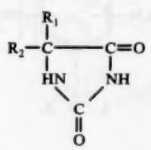
U.S. Cl. 528—322 6 Claims

1. A heat-resistant thermosetting resin composition consisting essentially of the reaction product of at least one component (A), at least one component (B) and at least one component (C) under molar ratios satisfying the conditions $0 < B/B+C) \leqq 0.5$ and $1 \leqq A/(B+C) < 2$ wherein:

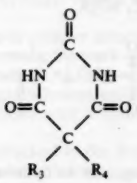
component (A) is bis-imide of the general formula:



wherein R is a divalent radical selected from the group consisting of straight or branched alkylene radicals and having a ring of five to six carbon atoms, heterocyclic radical having at least any one of oxygen, nitrogen and sulfur, phenylene radical, polycyclic aromatic radical, and a plurality of phenylene or alicyclic radicals directly bonded with any one of — O —, $-CH_2-$, $-SO_2-$, —NHCO—, $-NR_5-$, $-NR_5R_6-$, each of R_5 and R_6 being an alkyl radical of one to four carbon atoms, a cycloalkyl radical having an alicyclic ring of five to six carbon atoms or a phenyl radical and R′ is divalent radical of an acid selected from the group consisting of maleic, citraconic and tetrahydrophthalic acid; component (B) is selected from the group consisting of cyanuric acid, isocyanuric acid and tris (epoxypropyl) isocyanurate; and component (C) is selected from the group consisting of pyromellitic diimide; benzophenone tetracarboxylic acid diimide; 2, 3, 6, 7-naphthalene-tetracarboxylic acid diimide; 3, 3′, 4, 4′-diphenyltetra-carboxylic acid diimide; hydantoin or derivative of the formula:



wherein R_1 and R_2 may be the same or different and represent hydrogen or one to three carbon atom alkyl radicals, and barbituric acid or derivative of the formula:



wherein R_3 and R_4 may be the same or different and represent hydrogen or one to five carbon atom alkyl radicals.

4,107,154

ANIONIC COPOLYMERIZATION OF 2-PYRROLIDONE WITH C_7-C_{12} LACTAM

Robert Bacskai, Kensington, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 687,968, May 19, 1976, Ser. No. 724,801, Ser. No. 724,802. This application Mar. 2, 1977, Ser. No. 773,441 Int. Cl.[2] C08G *69/24*

U.S. Cl. 528—312 20 Claims

2. The process according to claim 1 wherein said alkaline polymerization catalyst is potassium or sodium pyrrolidonate.

4,107,155

POLYSULFONAMIDES

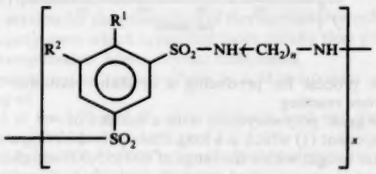
George Leland Fletcher, Pittsford, and Stewart H. Merrill, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 29, 1977, Ser. No. 811,417

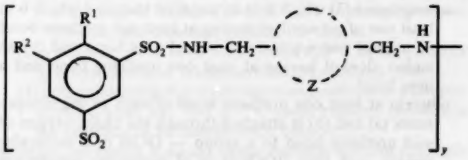
Int. Cl.[2] C08G *75/30*

U.S. Cl. 528—373 10 Claims

1. A polymer comprising repeating units having the structures



and



wherein

R^1 and R^2 are the same or different, and are each hydrogen, halogen or alkyl from 1 to 3 carbon atoms,

n is 2 or 3,

x and y are mole percentage amounts of the respective repeating units

x ranging from 0 to about 90% and y being at least 10%, and

Z represents the atoms necessary to form a saturated or unsaturated carbocyclic ring having from 5 to 7 carbon ring atoms.

4,107,156

PROCESS FOR PREPARING GEL POLYMER OF VINYL COMPOUND AND GEL POLYMER THEREOF

Takashi Sunamori, and Noboru Nishii, both of Otake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Jun. 30, 1975, Ser. No. 591,860

Claims priority, application Japan, Jul. 5, 1974, 49/76271; Jul. 11, 1974, 49/78717

Int. Cl.[2] C08F *4/28, 2/16, 20/18, 20/56*

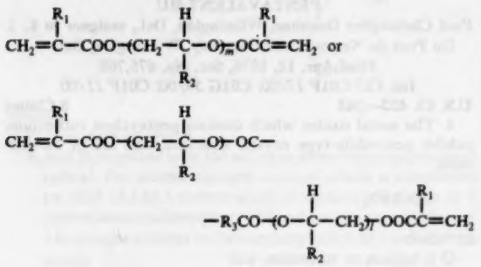
U.S. Cl. 526—91 11 Claims

1. A process for preparing a gel polymer in the absence of peramides, hydroperoxides, persulfates and peroxides which consists essentially of: admixing a composition (B) which comprises at least one compound which, in an aqueous medium, has at least one hydroxyl group with at least one compound (C)

capable of producing ferric ions or cerric ions in an aqueous medium, so as to form an intermolecular compound of (B) and (C),

reacting said intermolecular compound with a sulfur compound (D) which is capable of producing sulfur-containing ions selected from the group consisting of SO_2^{-2}, SO_3^{-2}, $S_2O_3^{-2}$, $S_2O_4^{-2}$, $S_2O_5^{-2}$, $S_2O_6^{-2}$, $S_2O_7^{-2}$, $S_3O_6^{-2}$, $S_4O_6^{-2}$, $S_5O_6^{-2}$, and $S_6O_6^{-2}$, in an aqueous medium, so as to form a polymerization initiator; and

reacting an aqueous composition (A) comprising an aqueous solvent and at least one water soluble vinyl compound selected from the group consisting of alkyl acrylates having 1 to 4 carbon atoms in the alkyl group, alkyl methacrylates having 1 to 4 carbon atoms in the alkyl group, acrylamide, methacrylamide, acrylic acid, methacrylic acid, itaconic acid, crotonic acid, α-methyleneglutaric acid, p-vinylbenzene sulfonic acid, 2-sulfoethyl acrylate, 2-sulfoethyl methacrylate, 2-acrylamide-2-methylpropane sulfonic acid and sodium, potassium and ammonium salts of said acids; diallyldimethyl ammonium bromide; methylene bisacrylamide, methylene bismethacrylamide; compounds having the general formula,



wherein R_1 and R_2 are —H or —CH_3, R_3 is an alkalene group, —CH=CH—,

or

and *m* and *l* is an integer of 1 to 10; glycerin triacrylate, glycerin trimethacrylate, trimethylolpropane triacrylate, trimethylolpropane trimethylacrylate, pentaerythritol pentaacrylate, pentaerythritol pentamethacrylate; acryloyl or methacryloyl compounds of N-methylol- or N-alkylol-benzoguanamine, acryloyl or methacryloyl compounds of N-methylol- or N-alkylol-melamine in the presence of said polymerization initiator to form said gel polymer.

4,107,157

BARBITURIC ACID ANTIGENS AND ANTIBODIES SPECIFIC THEREFOR

Sidney Spector, Livingston, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 378,744, Jul. 12, 1973 abandoned, which is a division of Ser. No. 174,517, Aug. 24, 1971, Pat. No. 3,766,162. This application Mar. 23, 1976, Ser. No. 670,210

Int. Cl.[2] A61K *37/06;* **C07G** *7/00*

U.S. Cl. 260—112 B **2 Claims**

1. A barbituric acid specific antibody consisting of a gamma globulin fraction protein having a multiplicity of sites which will selectively complex with a 5-substituted-1,3-unsubstituted-barbituric acid and an antigen consisting essentially of a 5-substituted-1,3-unsubstituted-barbituric acid derivative coupled through said 5-substituent by means of a peptide linkage to an immunogenic carrier material selected from the group consisting of proteins and polypeptides, said barbituric acid antibody being prepared by innoculating a host animal with the aforementioned antigen, collecting the serum from said host animal and precipitating the antibody therefrom.

4,107,158

PROCESS FOR MAKING AN OCTAPEPTIDE USEFUL FOR THE TREATMENT OF DIABETES

Pierre Lefrancier, Bures-sur-Yvette, France, assignor to Choay S.A., Paris, France

Filed Dec. 29, 1975, Ser. No. 644,844

Claims priority, application France, Dec. 31, 1974, 74 43513

Int. Cl.[2] C07C *103/52;* **A61K** *37/00*

U.S. Cl. 260—112.5 R **21 Claims**

1. The process for the preparation of the octapeptide leucyl—seryl—arginyl—leucyl—phenylalanyl—aspartyl—asparaginyl—alanine of the L-series free of racemized products, by stereospecific condensation, which comprises condensing: (1) (a) the pentapeptide leu—ser—arg—lue—phe— of the L-series with (b) the tripeptide asp—asn—ala of the L-series or (2) (a) the tripeptide leu—ser—arg of the L-series with (b) the pentapeptide leu—phe—asp—asn—ala of the L-series, these amino acids having the respective free amino, hydroxyl, N-guanidino and acid groups blocked to cause them to be inert during the condensation reaction, the condensation being carried out in a solvent for the defined peptides, completing the respective condensations, freeing without degradation the peptide formed of the groups which were blocked during the condensations and isolating the above-defined L-octapeptide.

4,107,159

ACETAL HYDRAZONES OF 2-HYDRAZINO-3H-1,4-BENZODIAZEPINE

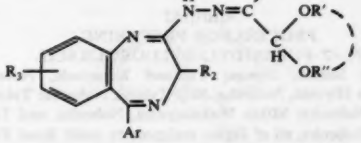
Gerald N. Evenson, Cooper, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 775,887, Mar. 9, 1977. This application Dec. 30, 1977, Ser. No. 865,976

Int. Cl.[2] C07D *243/20, 401/04, 405/12, 405/14*

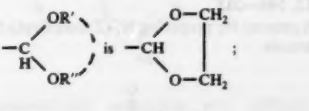
U.S. Cl. 260—239 BD **8 Claims**

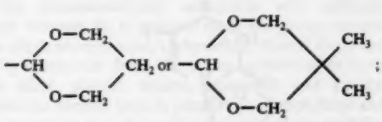
1. A compound of the formula III:



III

wherein R' and R'' are alkyl of 1 to 3 carbon atoms, inclusive, or the group





wherein R_1 is alkyl of 1 to 3 carbon atoms, inclusive; wherein

R_2 is hydrogen, methyl or ethyl; wherein R_3 is hydrogen, fluoro, chloro, bromo, nitro and $-CF_3$; and wherein Ar is pheny, o-chlorophenyl, 2,6-difluorophenyl, and 2-pyridyl, and the pharmacologically acceptable acid addition salts thereof.

4,107,160

CONTINUOUS PROCESS FOR THE RECOVERY OF CAPROLACTAM

Ovidiu Dicoi, Offenbach, and Erwin Doerr, Markt Schwaben, both of Fed. Rep. of Germany, assignors to Zimmer Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Aug. 24, 1977, Ser. No. 827,370
Int. Cl.[2] C07D *201/12*
U.S. Cl. 260—239.3 A **2 Claims**

1. A process for the continuous recovery of caprolactam from either solid polycaprolactam waste by a depolymerization reaction or from liquid polycaprolactam extraction water produced by a caprolactam extraction zone wherein, in either instance, a caprolactam water vapor mixture is produced and subsequently ungraded, in a distillation zone, to provide a concentrated caprolactam solution and a dilute, caprolactam water vapor overhead mixture which comprises

condensing a minor portion of the caprolactam water vapor mixture;

recycling the resultant condensed mixture to the distillation zone;

compressing the remaining, major portion of the water vapor;

admixing the compressed vapor with fresh steam;

superheating the resultant compressed vapor, fresh steam mixture; and

passing the superheated mixture to the caprolactam depolymerization reaction or caprolactam extraction zone.

4,107,161

BIS(TRIAMCINOLONE ACETONIDE)-4,4'-METHYLENEBIS-(3-METHOXY-2-NAPHTHOATE)

Agustin Agusti, Barcelona, Spain, assignor to J. Uriach & Cia. S.A., Barcelona, Spain

Filed Mar. 18, 1974, Ser. No. 452,322
Int. Cl.[2] C07J *71/00*
U.S. Cl. 260—239.55 D **5 Claims**

1. Bis(triamcinolone acetonide)4,4'-methylene-bis(3-methoxy-2-naphthoate).

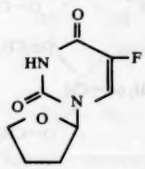
4,107,162

PROCESS FOR PREPARING N_1-(2'-FURANIDYL)-5-FLUOROURACIL

Nobuyuki Suzuki, Hyuga; Yukinari Kobayashi, Nobeoka; Yumiko Hiyoshi, Nobeoka; Seiji Takagi, Nobeoka; Takanori Sone, Nobeoka; Mikio Wakabayashi, Nobeoka, and Tuneo Sowa, Nobeoka, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

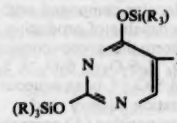
Filed Nov. 9, 1976, Ser. No. 740,324
Claims priority, application Japan, Nov. 10, 1975, 50-134805
Int. Cl.[2] C07D *239/54*
U.S. Cl. 544—313 **9 Claims**

1. A process for preparing N_1-(2'-furanidyl)-5-fluorouracil of the formula



(I)

which comprises reacting a 2,4-bis(trialkylsilyl)-5-fluorouracil of the formula



(II)

wherein R is a lower alkyl group, with 2,3-dihydrofuran in the presence of a catalyst selected from the group consisting of stannic chloride, aluminum chloride, titanium tetrachloride, silicon tetrachloride, antimony pentachloride, boron trifluoride, bromine, iodine, lithium iodide, sodium iodide, potassium iodide and mixtures thereof and a proton donor selected from the group consisting of water, an alcohol, an organic acid and mixtures thereof.

4,107,163

PEROVSKITE-TYPE COMPOSITIONS CONTAINING PENTAVALENT RU

Paul Christopher Donohue, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 12, 1976, Ser. No. 675,768
Int. Cl.[2] C01F *17/00*; C01G *55/00*; C01F *11/00*
U.S. Cl. 423—263 **5 Claims**

1. The metal oxides which contain pentavalent ruthenium, exhibit perovskite-type crystal structure, and are of the formula

$$Q_2MRuO_6$$

in which

Q is barium or strontium, and

M is yttrium, bismuth or rare earth metal of atomic number 57 to 70, provided that when Q is strontium, M is not bismuth.

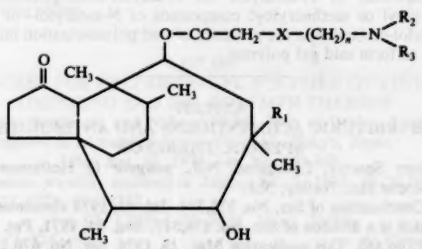
4,107,164

CERTAIN PLEUROMULILIN ESTER DERIVATIVES

Helmut Egger, and Hellmuth Reinshagen, both of Vienna, Austria, assignors to Sandoz Ltd., Basel, Switzerland

Division of Ser. No. 606,430, Aug. 21, 1975, Pat. No. 4,032,530, which is a division of Ser. No. 427,514, Dec. 26, 1973, Pat. No. 3,919,290, which is a continuation-in-part of Ser. No. 294,642, Oct. 3, 1972, abandoned. This application Jan. 10, 1977, Ser. No. 758,133
Claims priority, application Switzerland, Oct. 5, 1971, 14450/71; Oct. 5, 1971, 14451/71; May 25, 1972, 7738/72; May 25, 1972, 7739/72; May 25, 1972, 7740/72
Int. Cl.[2] C07D *295/08, 295/10, 295/12, 295/14*
U.S. Cl. 544—380 **31 Claims**

1. A compound of the formula:

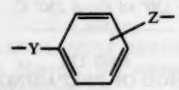


either

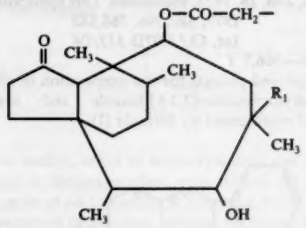
R_1 is ethyl or vinyl,

n is an integer from 2 to 5,

X is sulphur
a group



or a group $=N-R_4^I$,
wherein
either Y and Z are both sulphur, or
one of Y and Z is oxygen and the other is sulphur, and
R_4^I is hydrogen or a group of the formula:



wherein
R_1 is as defined above,
R_2 and R_3 together with the nitrogen atom form a piperazinyl radical, the second nitrogen atom of which is substituted by alkyl of 1 to 5 carbon atoms or hydroxyalkyl of 1 to 4 carbon atoms (alkancyloxy of 2 to 5 carbon atoms) alkyl of 1 to 4 carbon atoms or (benzoyloxy) alkyl of 1 to 4 carbon atoms,

or
wherein
R_1 is as defined above,
n is the number 2,
R_3 is alkyl of 1 to 10 carbon atoms, hydroxyalkyl of 1 to 4 carbon atoms, (alkanoyloxy of 2 to 5 carbon atoms) alkyl of 1 to 4 carbon atoms or (benzoyloxy) alkyl of 1 to 4 carbon atoms,
X is the group $=N-R_4^{II}$, and
R_2 together with R_4^{II} forms an ethylene bridge between both nitrogen atoms,
and pharmaceutically acceptable acid addition salts and quaternary salts thereof.

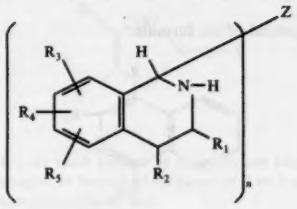
4,107,165

TRIS[TETRAHYDROISOQUINOLINE] COMPOUNDS

Parthasarathi Rajagopalan, Westbury, and Irwin J. Pachter, Woodbury, both of N.Y., assignors to Endo Laboratories, Garden City, N.Y.

Continuation of Ser. No. 561,435, Mar. 25, 1975, abandoned, which is a division of Ser. No. 336,973, Mar. 1, 1973, Pat. No. 3,928,611, which is a continuation of Ser. No. 165,346, Jul. 22, 1971, abandoned, which is a continuation-in-part of Ser. No. 1,029, Jan. 6, 1970, abandoned. This application Sep. 15, 1976, Ser. No. 723,336
Int. Cl.[2] C07D *401/06*
U.S. Cl. 260—288 CE **12 Claims**

1. A compound having formula:



wherein:
R_1 and R_2 individually represent hydrogen or lower alkyl;
R_3, R_4, R_5 represent hydrogen, lower alkyl, halogen, hydroxy, lower alkoxy, lower alkenoxy, lower alkynoxy, acetoxy, butyryloxy, phenoxy, phenyl lower alkoxy, or R_3 and R_4 or R_4 and R_5 may be linked to form methylenedioxy;
n is 3; and
Z is a straight or branched alkanetriyl chain having 5 to 18 carbon atoms which is non-substituted or substituted by a nitro or amino group;
or a pharmaceutically acceptable acid addition salt thereof.

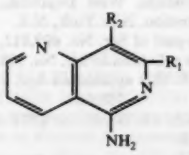
4,107,166

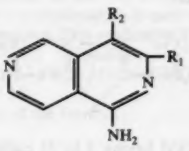
CERTAIN AMINO NAPHTHYRIDINES

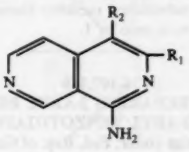
Joseph Mayer, New York, N.Y., and Margaret H. Sherlock, Bloomfield, N.J., assignors to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 631,010, Nov. 12, 1975, Pat. No. 4,017,500, which is a division of Ser. No. 379,525, Jul. 16, 1973, Pat. No. 3,928,367, which is a continuation-in-part of Ser. No. 119,377, Feb. 26, 1971, abandoned, which is a continuation-in-part of Ser. No. 816,075, Apr. 14, 1969, abandoned. This application Apr. 11, 1977, Ser. No. 786,159
Int. Cl.[2] C07D *471/04*
U.S. Cl. 260—294.8 C **5 Claims**

1. A compound of the formula:



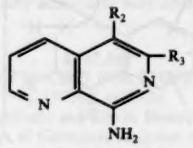




and the pharmaceutically acceptable acid addition salts thereof, wherein R_1 is selected from the group consisting of lower alkyl, phenyl, benzyl, phenethyl, thienyl, furyl and pyridyl, R_2 is selected from the group consisting of hydrogen, lower alkyl, phenyl, benzyl, phenethyl and pyridyl and wherein the phenyl, benzyl, phenethyl, thienyl, furyl and pyridyl substituents and the pyrido moieties of the naphthyridine structures have lower alkyl, lower alkoxy, halo, nitro, lower

alkyl mercapto, trifluoromethyl and di(lower alkyl) amino substituents.

5. A compound of the formula:



wherein R_3 is selected from the group consisting of lower alkyl, phenyl, benzyl and phenethyl, and R_2 is selected from the group consisting of hydrogen, lower alkyl, phenyl, benzyl, phenethyl and pyridyl and wherein the phenyl, benzyl, phenethyl and pyridyl substituents and the pyrido moieties of the naphtyridine structures have lower alkyl, lower alkoxy, halo, nitro, lower alkyl mercapto, trifluoromethyl and di(lower alkyl) amino substituents.

4,107,167

ALKYL α-[3-(PYRIDYL)-ANILINOMETHYLENE]ACETOACETATES

Roman R. Lorenz, and William H. Thielking, both of Schodack, N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 635,758, Nov. 26, 1975, abandoned, which is a division of Ser. No. 479,627, Jun. 17, 1974, abandoned. This application Sep. 15, 1977, Ser. No. 833,484

Int. Cl.² C07D *213/42*

U.S. Cl. 260—295 R **2 Claims**

1. Lower-alkyl α-(3-PY-anilinomethylene)acetoacetate where PY is 4(or 3)-pyridyl or 4(or 3)-pyridyl having one or two non-tertiary lower-alkyl substituents.

4,107,168

PHOSPHORUS SUBSTITUTED DIMERCAPTO THIADIAZOLES

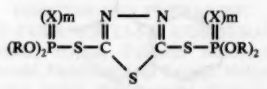
Abraham O. Okorodudu, West Deptford, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 699,812, Jun. 24, 1976, abandoned, which is a division of Ser. No. 598,953, Jul. 24, 1975, Pat. No. 3,980,573. This application Apr. 15, 1977, Ser. No. 788,064

Int. Cl.² C07D *285/12*; C07F *9/65*

U.S. Cl. 260—302 E **9 Claims**

1. The compound



wherein R is an alkyl having 1 to 25 carbon atoms, an aryl group or an alkyl substituted member thereof having 6 to 14 carbon atoms and *m* is zero or 1.

4,107,169

METHOD OF PREPARING 2-ARYL BENZOXAZOLES AND 2-ARYL BENZOTHIAZOLES

Klaus Schrage, Konigswinter, Fed. Rep. of Germany, assignor to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Apr. 20, 1977, Ser. No. 789,301

Claims priority, application Fed. Rep. of Germany, May 4, 1976, 2619547

Int. Cl.² C07D *277/66*

U.S. Cl. 260—304 P **9 Claims**

1. A method for preparing a 2-aryl benzoxazoles or 2-aryl benzthiazoles which comprises reacting a trichloromethyl aromatic compound with an aromatic compound carrying one amino group and one hydroxy or mercapto group in the ortho position with respect to the amino group or an acid addition salt thereof at about 130° to about 250° C.

4,107,170

METHOD OF PREPARING dl 6-PHENYL-2,3,5,6-TETRAHYDROIMIDAZO-[2,1-b]THIAZOLE AND ACID ADDITION SALTS THEREOF

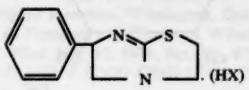
Murray Garber, Trenton, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 626,700, Oct. 29, 1975, abandoned, which is a continuation-in-part of Ser. No. 436,230, Jan. 24, 1974, abandoned, which is a continuation-in-part of Ser. No. 371,228, Jun. 18, 1973, abandoned. This application Feb. 14, 1977, Ser. No. 768,133

Int. Cl.² C07D *513/04*

U.S. Cl. 260—306.7 T **11 Claims**

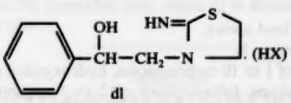
1. An improved process for the preparation of dl-6-phenyl-2,3,5,6-tetrahydroimidazo[2,1-b]thiazole and acid-addition salts thereof represented by formula (I):



(I)

dl

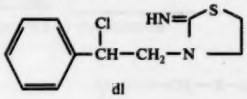
wherein the acid HX is selected from the group consisting of hydrochloric acid, hydrobromic acid and p-toleuenesulfonic acid; comprising the following reaction sequence: (a) replacing the hydroxy group of dl-3-(β-hydroxyphenethyl)-2-iminothiazolidine and acid-addition salts thereof represented by formula (II):



(II)

dl

wherein HX is as hereinabove defined; with a chloro group by dissolving said formula (II) compound or an acid-addition salt thereof in a chlorination mixture prepared from at least 2 molar equivalent of concentrated aqueous hydrochloric acid of about 36% and at least 1 molar equivalent of sulfuric acid of about 94% to 98%, maintaining said solutions at a temperature range from 10° C. to 70° C. until the chlorination is essentially completed to obtain a solution of dl-3-(β-chlorophenethyl)-2-iminothiazolidine represented by formula (III):



(III)

dl

in said acidic chlorination mixture; (b) diluting said acidic chlorination mixture with water, adding a water-immiscible organic solvent and ring-closing said formula (III) dl-3-(β-chlorophenethyl)-2-iminothiazoline to dl-6-phenyl-2,3,5,6-tetrahydroimidazo[2,1-b]thiazole by intramolecularly removing the elements of hydrochloric acid therefrom with a inorganic alkali metal base added to the above acidic solutions of said formula (III) compound in sufficient quantity to increase to, and maintain the pH of said mixture from about 7.5 to 9 at a temperature range from about 20° C. to 55° C., and recovering said formula (I) dl-6-phenyl-2,3,5,6-tetrahydroimidazo[2,1-b]thiazole base from the water-immiscible organic solvent phase, or converting said formula (I) compound to its HX salt, by adding a mixture of the appropriate HX acid as hereinabove

defined and a lower C_1–C_4 alcohol to said organic solvent phase.

4,107,171

ALKANOLAMINE DERIVATIVES

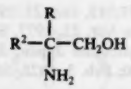
Louis A. Jurisch, Marengo, Ill., assignor to IMC Chemical Group, Inc., Terre Haute, Ind.

Continuation-in-part of Ser. No. 652,432, Jan. 26, 1976, abandoned, which is a division of Ser. No. 601,699, Aug. 4, 1975, Pat. No. 3,994,919. This application Dec. 13, 1976, Ser. No. 750,080

Int. Cl.² C07D *263/06*

U.S. Cl. 260—307 FA **7 Claims**

1. A product obtained by reacting an alkanolamine represented by the formula



where R is methyl, ethyl or hydroxymethyl and R^2 is hydrogen, methyl or hydroxymethyl, with oiticica oil in a ratio of 267 g per mole of alkanolamine at temperatures of 110° to 130° C in the presence of benzene, toluene, or xylene solvent.

4,107,172

URICOSURIC DIURETIC COMPOSITION

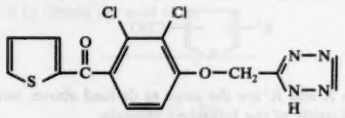
John Hans Biel, Lake Bluff, Ill.; Dilbagh S. Bariana, Cote St. Luc, and Anthony K. L. Fung, Pierrefonds, both of Canada, assignors to Abbott Laboratories, North Chicago, Ill.

Filed Mar. 1, 1974, Ser. No. 447,182

Int. Cl.² C07D *257/04*; A61K *31/41*

U.S. Cl. 260—308 D **1 Claim**

1. A tetrazole compound of the formula



4,107,173

3-SULFOMETHYL-1,2,4-TRIAZOLE-5-THIOL AND ITS ALKALI METAL SALTS

David A. Berges, Wayne, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 726,377, Sep. 24, 1976. This application Dec. 1, 1977, Ser. No. 856,447

Int. Cl.² C07D *249/12*

U.S. Cl. 260—308 R **3 Claims**

1. 3-Sulfomethyl-1,2,4-triazol-5-thiol and its alkali metal salts.

4,107,174

IMIDYL COMPOUNDS

Marcus Baumann, Basel; Vratislav Kvita, Muttenz; Martin Roth, Basel, all of Switzerland, and John Sidney Waterhouse, Cherry Hinton, England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

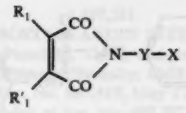
Filed Jun. 15, 1976, Ser. No. 696,346

Claims priority, application Switzerland, Jun. 18, 1975, 7951/75; Nov. 27, 1975, 15390/75

Int. Cl.² C07D *207/46*

U.S. Cl. 260—326 NS **8 Claims**

1. A compound of the formula

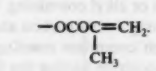


wherein

R_1 and R'_1 are each methyl or together are tetramethylene,

Y is a straight or branched alkylene of 2 to 6 carbon atoms or 1,4-cyclohexylene, and

X is $-OCOCH=CH_2$ or



4,107,175

1,3-BENZODITHIOLANES

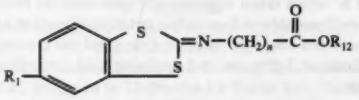
Peter W. Sprague, Titusville, and James E. Heikes, East Windsor, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 705,849, Jul. 16, 1976. This application Dec. 17, 1976, Ser. No. 751,552

Int. Cl.² C07D *339/06*

U.S. Cl. 260—327 M **21 Claims**

1. A compound having the formula



or a pharmaceutically acceptable salt thereof, wherein R_1 is hydrogen, halogen, trifluoromethyl, alkyl, alkoxy, nitro, amino or hydroxy; R_{12} is hydrogen or alkyl; and n is 0, 1, 2, 3, 4 or 5; wherein the terms "alkyl" and "alkoxy" refer to groups having 1 to 4 carbon atoms.

4,107,176

MONO-N-TOSYLSULFIMIDES, THEIR PREPARATION AND THEIR REACTION PRODUCTS

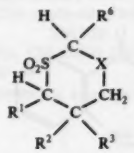
David H. Evans, and Richard B. Greenwald, both of Cambridge, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 679,487, Apr. 23, 1976, abandoned, which is a continuation-in-part of Ser. No. 591,463, Jun. 30, 1975, abandoned. This application Feb. 2, 1977, Ser. No. 764,862

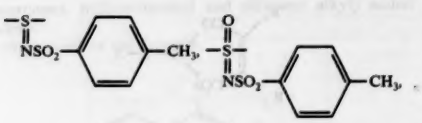
Int. Cl.² C07D *339/08*; G03C *5/26*

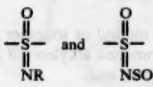
U.S. Cl. 260—327 M **71 Claims**

1. A compound of the formula



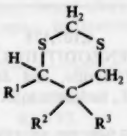
wherein R^1 is selected from hydrogen, alkyl containing 1 to 4 carbon atoms and $-CO_2R^4$ wherein R^4 is alkyl containing 1 to 4 carbon atoms; R^2 and R^3 when taken individually are selected from hydrogen and alkyl containing 1 to 4 carbon atoms and R^2 and R^3 when taken together are spiro; R^6 is selected from hydrogen and $-(CH_2)_nSR^0$ wherein *n* is 0, 2, 3, 4 or 5 and R^0 is alkyl containing 1 to 4 carbon atoms and X is selected from





wherein R is hydrogen or alkyl containing 1 to 4 carbon atoms and R′ is alkyl containing 1 to 4 carbon atoms.

56. A method which comprises reacting (a) a 1,3-dithiane unsubstituted in the 2-position having the formula



wherein R^1 is selected from hydrogen, alkyl containing 1 to 4 carbon atoms and $—CO_2R^4$ wherein R^4 is alkyl containing 1 to 4 carbon atoms; R^2 and R^3 when taken individually are selected from hydrogen and alkyl containing 1 to 4 carbon atoms and R^2 and R^3 when taken together are spiro and (b) N-chloro-p-toluenesulfonamide sodium salt in aqueous alkanol at a temperature between about 20° and 30° C to yield the corresponding 1-tosylimino-1,3-dithiane and isolating said 1-tosylimino-1,3-dithiane.

4,107,177

PROCESS FOR PREPARING HETEROARYLBENZOXEPIN-ACETIC ACIDS, PRECURSORS AND DERIVATIVES THEREOF

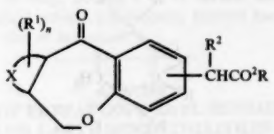
Arthur Raymond McFadden, East Brunswick, and Daniel Eugene Aultz, Middlesex, both of N.J., assignors to American Hoechst Corporation, Bridgewater, N.J.

Division of Ser. No. 607,926, Aug. 26, 1975, Pat. No. 4,025,640. This application Apr. 19, 1977, Ser. No. 788,958

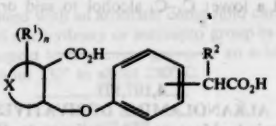
Int. Cl.[2] C07D *333/24*

U.S. Cl. 260—332.2 C **5 Claims**

1. A process for the preparation of a compound of the formula



wherein X together with the carbon atoms to which it attaches is a thienyl radical R is hydrogen or straight or branched chain alkyl of from 1 to 5 carbon atoms; R^1 is hydrogen or alkyl of 1 to 4 carbon atoms; R^2 is hydrogen or methyl; *n* is the integer 1, 2 or 3; and salts prepared from pharmaceutically acceptable bases which comprises cyclizing, with a dehydrating agent at a temperature of from 50° to 125° C. and for a time of 5 minutes to 12 hours, a dicarboxylic acid of the formula



wherein X and the carbon atoms to which it attaches, R^1, R^2 and *n* are as defined earlier.

4,107,178

THIOPRENE OR FURAN DERIVATIVES AND PROCESS FOR PREPARATION THEREOF

Genichi Tsuchihashi, Tama, and Katsuyuki Ogura, Sagamihara, both of Japan, assignors to Sagami Chemical Research Center, Tokyo, Japan

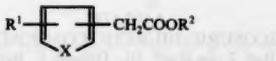
Division of Ser. No. 651,112, Jan. 21, 1976, Pat. No. 4,051,151. This application Apr. 22, 1977, Ser. No. 790,133

Claims priority, application Japan, Jan. 23, 1975, 50-9297; Jan. 27, 1975, 50-10520; Feb. 3, 1975, 50-13388; Nov. 25, 1975, 50-140249

Int. Cl.[2] C07D *333/24, 307/12, 307/16*

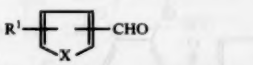
U.S. Cl. 260—332.2 A **1 Claim**

1. A process for preparing thienylacetic acid, furylacetic acid or an alkyl ester of each of said acids expressed by the following formula



(I)

wherein X represents S or O, and R^1 and R^2, independently from each other, represent a hydrogen atom or an alkyl group, which comprises a first step of reacting at a temperature of from room temperature to 150° C an aldehyde compound of thiophene or furan expressed by the following formula

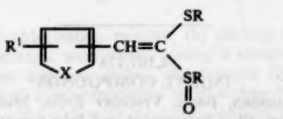


(V)

wherein X and R^1 are the same as defined above, with a mercaptal S-oxide of the following formula

(II)

wherein R represents an alkyl or phenyl group in the presence of, as a strongly basic catalyst, a member selected from the group consisting of an alkali or alkaline earth metal hydride, an alkyl lithium, an alkali metal amide, an alkali or alkaline earth metal hydroxide, an alkali or alkaline earth metal alkoxide, an alkaline earth metal oxide, a quaternary ammonium hydroxide, and an alkali metal carbonate, to form a thiophene or furan derivative of the following formula



(II)

wherein X, R^1 and R are the same as defined above, and a second step of neutralizing the strong base contained in the resulting reaction mixture and then reacting the reaction mixture at a temperature of from −30° to 150° C with water or an alcohol of the following formula

(III)

wherein R^2 is the same as defined above, in the presence of a mineral acid catalyst selected from the group consisting of hydrogen halides and hydrohalic acids.

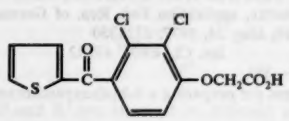
4,107,179

METHOD FOR PREPARING TICRYNAFEN

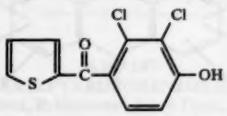
Harold Graboyes, Overbrook Hills, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Filed Aug. 22, 1977, Ser. No. 826,604
Int. Cl.² C07D *333/24*
U.S. Cl. 260—332.2 A 5 Claims

1. The method of preparing ticrynafen having the formula:



or its sodium or potassium salts comprising reacting a phenolic compound of the formula:



with sodium or potassium chloroacetate in an aqueous solvent at about 90°–95° C. at a pH of about 9–10 in the presence of sodium or potassium iodide in the amount of about 1–15% by weight of said phenolic compound to give the sodium or potassium salt of ticrynafen and optionally reacting said salt product with acid to obtain the acid form.

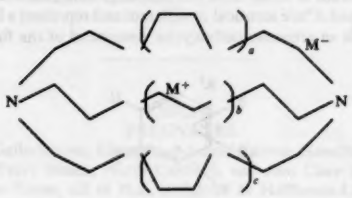
4,107,180

SALTS OF ALKALI METAL ANIONS AND PROCESS OF PREPARING SAME

James L. Dye, East Lansing; Joseph M. Ceraso, Lansing, both of Mich.; Frederick J. Tehan, Utica, N.Y., and Mei Tak Lok, Urbana, Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 29, 1974, Ser. No. 528,381
Int. Cl.² C07F *1/04, 1/06*
U.S. Cl. 260—338 9 Claims

1. A compound of an alkali metal anion salt of an alkali metal cation in a bicyclic polyoxadiamine compound of the formula:



where M^+ is a cation of an alkali metal, M^- is an anion of an alkali metal, said M^+ and M^- are selected from the group consisting of Na, K, Rb, and Na and K, and *a*, *b* and *c* are integers from 0 to 2.

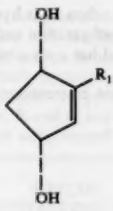
4,107,181

USEFUL PROSTAGLANDIN INTERMEDIATES

David A. Evans, Pasadena, Calif., assignor to Regent of the University of California, Berkeley, Calif.

Continuation of Ser. No. 687,419, May 17, 1976, abandoned, which is a division of Ser. No. 499,287, Aug. 21, 1974, abandoned, which is a continuation-in-part of Ser. No. 349,888, Apr. 10, 1973, abandoned. This application Feb. 14, 1977, Ser. No. 768,314
Int. Cl.² C07D *317/12*
U.S. Cl. 260—340.9 R 1 Claim

1. A compound of the formula:



wherein R_1 is a member of the group consisting of alkyl, (cis or trans) alkenyl and alkynyl groups of from 2 to 9 carbon atoms substituted by a terminal 1,3-dioxacyclopentyl group.

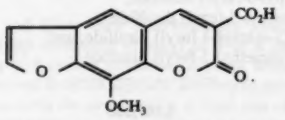
4,107,182

7-OXO-9-METHOXY-7H-FURO[3,2-G][1]BENZOPYRAN-6-CARBOXYLIC ACID

Arnold A. Liebman, Verona, and Yu-Ying Liu, Westwood, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jul. 29, 1977, Ser. No. 820,265
Int. Cl.² C07D *493/04*
U.S. Cl. 260—343.21 1 Claim

1. A compound of the formula



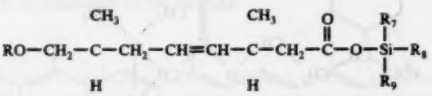
4,107,183

SYNTHESIS OF OPTICALLY ACTIVE CARBOXYLIC ACID ESTERS

Noal Cohen, Montclair, and Gabriel Saucy, Essex Fells, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

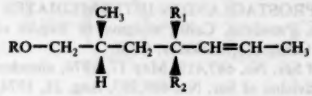
Division of Ser. No. 638,722, Dec. 8, 1975, Pat. No. 4,041,058, which is a continuation-in-part of Ser. No. 544,154, Jan. 27, 1975, abandoned. This application May 16, 1977, Ser. No. 796,929
Int. Cl.² C07D *309/22*
U.S. Cl. 260—345.8 R 1 Claim

1. A process for producing a compound of the formula:

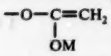


wherein R_7, R_8 and R_9 are lower alkyl, R taken together with the attached oxygen moiety forms an ether protecting group removable by acid catalyzed cleavage or hydrogenolysis;

comprising subjecting an optically active isomer of the formula:



wherein one of R_1 and R_2 is hydrogen and the other is



with the proviso that when R_1 is hydrogen, the 5–6 double bond has a trans configuration and when R_2 is hydrogen, the 5–6 double bond has a cis configuration; and M is an alkali metal;

to Claisen rearrangement by reaction with an agent of the formula:

wherein R_7, R_8 and R_9 are as above; and X is halogen.

4,107,184

3-FURYL ALKYL DISULFIDES

William J. Evers, Middletown; Howard H. Heinsohn, Jr., Hazlet, and Manfred Hugo Vock, Locust, all of N.J., assignors to International Flavors & Fragrances Inc., Union Beach, N.J.

Continuation-in-part of Ser. No. 551,045, Feb. 19, 1975. This application Oct. 7, 1975, Ser. No. 620,353

Int. Cl.[2] C07D *307/64*

U.S. Cl. 260—347.2 **5 Claims**

1. A 3-furan-alkyl disulfide selected from the group consisting of:

Ethyl(2-methyl-3-furyl) disulfide;

Isoamyl(2-methyl-3-furyl) disulfide;

Cyclohexyl(2-methyl-3-furyl) disulfide; and

Isoamyl(2,5-dimethyl-3-furyl) disulfide.

4,107,185

3-(3,4-EPOXY-4-METHYLCYCLOHEXYL)BUTYL ESTERS

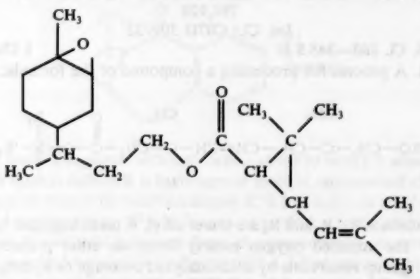
Jerry G. Strong, Warren, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 659,079, Feb. 18, 1976, Pat. No. 4,036,629, which is a continuation-in-part of Ser. No. 153,056, Jun. 14, 1971, abandoned. This application Apr. 1, 1977, Ser. No. 783,901

Int. Cl.[2] C07D *303/44*

U.S. Cl. 260—348.55 **1 Claim**

1. A compound of the formula:



which is named:

3-(3,4-Epoxy-4-methylcyclohexyl)butyl 2,2-dimethyl-3-(2-methylpropenyl)cyclopropanecarboxylate.

4,107,186

4-HYDROXYANTHRONES AND PROCESS OF PREPARATION

Gerd-Michael Petruck, Bergisch-Gladbach; Erich Klauke, Odenthal-Hahnenberg, and Horst Jäger, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

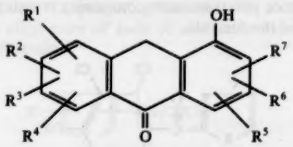
Filed Dec. 6, 1977, Ser. No. 858,035

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1976, 2655824; May 24, 1977, 2723350

Int. Cl.[2] C07C *49/82*

U.S. Cl. 260—351 **10 Claims**

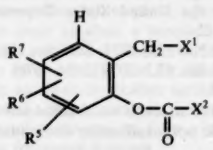
1. A process for preparing a 4-hydroxyanthrone of the formula



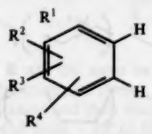
wherein

R^1 to R^7 are the same or different and denote hydrogen, hydroxyl, halogen, cyano, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkoxy, C_1–C_4 alkylmercapto, C_1–C_4 alkylsulphonyl, trifluoromethyl, trichloromethyl or an amino group of the formula

wherein R^8 and R^9 are identical or different and represent hydrogen, C_1–C_4 alkyl or C_1–C_4 alkylcarbonyl which comprises contacting a (2-halogeno-methyl)-phenyl haloformate of the formula

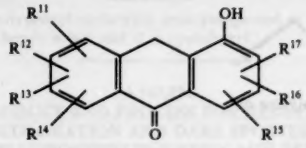


wherein R^5 to R^7 have the meanings indicated above and X^1 and X^2 are identical or different and represent a halogen with an aromatic carbocyclic compound of the formula

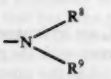


wherein R^1 to R^4 have the meanings indicated above, in the presence of a Friedel-Crafts catalyst at a temperature in the range of from 0° to 300° C.

8. A 4-hydroxyanthrone of the formula



wherein R^{11} to R^{17} are identical or different and denote hydrogen, hydroxyl, fluorine, chlorine, bromine, cyano, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylmercapto, C_1–C_4 alkylsulphonyl, trifluoromethyl, trichloromethyl or an amino group of the formula



wherein R^8 and R^9 are identical or different and represent hydrogen, C_1–C_4 alkyl or C_1–C_4 alkylcarbonyl, at least one of the radicals R^{11} to R^{17} being different from hydrogen or methyl.

4,107,187

AMINOALKYLPYRROLOBENZOXAZALKANES

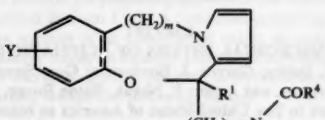
Richard C. Effland, Bridgewater; Larry Davis, Flemington, both of N.J., and Wolfgang Schaub, Kelkheim, Fed. Rep. of Germany, assignors to American Hoechst Corporation, Bridgewater, N.J.

Division of Ser. No. 661,505, Feb. 26, 1976, Pat. No. 4,029,672. This application Jan. 19, 1977, Ser. No. 760,509

Int. Cl.[2] C07D *498/04*

U.S. Cl. 260—326.29 **3 Claims**

1. A compound of the formula



wherein Y is hydrogen, halogen, lower alkoxy, lower alkyl, trifluoromethyl, nitro or amino, R^1 is hydrogen or lower alkyl; R^3 is a straight or branched chain alkyl of from 1 to 5 carbon atoms, phenyl or cycloalkyl of from 3 to 6 carbon atoms; R^4 is straight or branched chain alkyl of from 1 to 4 carbon atoms, phenyl, benzyl, phenethyl, cycloalkyl of from 3 to 6 carbon atoms, cycloalkylalkyl of from 4 to 6 carbon atoms, phenoxy or lower alkoxy; m is the integer 1 or 2 and *n* is the integer 1, 2 or 3.

4,107,188

PREGNANES

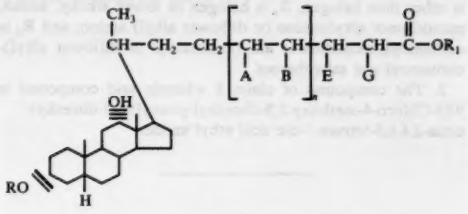
Hugo Gallo-Torres, Livingston; James Guthrie Hamilton, Nutley; Perry Rosen, North Caldwell, and Ann Clare Sullivan, Cedar Grove, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Apr. 22, 1977, Ser. No. 790,165

Int. Cl.[2] C07J *9/00*

U.S. Cl. 260—397.1 **9 Claims**

1. A compound of the formula:



wherein R is hydrogen or lower alkanoyl; R_1 is lower alkyl or hydrogen, A and B are individually hydrogen or taken together form a carbon to carbon bond; *n* is an integer from 0 to 1; E and G are individually hydrogen or taken together form a carbon to carbon bond; with the proviso that when *n* is 1 and A and B are hydrogen, E and G are also hydrogen and pharmaceutically acceptable salts thereof.

4,107,189

LIQUID CRYSTALLINE COMPOUNDS

Jan van der Veen, and Theodorus Cornelis Jozef Maria Hegge, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

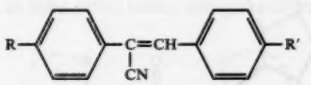
Continuation of Ser. No. 386,032, Aug. 6, 1973, abandoned. This application Oct. 7, 1975, Ser. No. 620,300

Claims priority, application Netherlands, Aug. 18, 1972, 7211383

Int. Cl.[2] C07C *121/70*

U.S. Cl. 260—404 **14 Claims**

1. A compound of the formula **1**



wherein R and R'are each independently moieties selected from the group consisting of alkyl of **3** to **8** carbon atoms, alkoxy of up to **8** carbon atoms and acyloxy wherein the acyl moiety is derived from an aliphatic carobxylic acid of up to 10 carbon atoms with the proviso that at least one of R and R' is other than methoxy.

4,107,190

NOVEL COMPOUNDS OF 9-PHENYL-3,7-DIMETHYL-2,4,6,8-NONATETRAENAMIDE

Werner Bollag, Basel; Rudolf Rüegg, Bottmingen, and Gottlieb Ryser, Basel, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

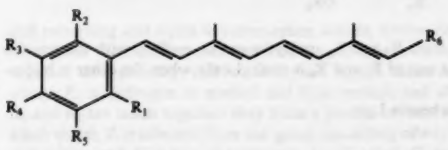
Division of Ser. No. 613,676, Sep. 15, 1975, Pat. No. 4,054,598. This application Jul. 18, 1977, Ser. No. 816,409

Claims priority, application Switzerland, Sep. 26, 1974, 13032/74; Jul. 9, 1975, 8962/75

Int. Cl.[2] C09F *5/00*; C11C *3/00*

U.S. Cl. 260—404 **2 Claims**

1. A compound of the formula:



wherein one of R_1 and R_2 is halogen or lower alkyl, and the other is halogen or lower alkoxy; R_3 and R_5 are hydrogen or

halogen or lower alkyl; with the proviso that one of R_3 and R_5 is other than halogen; R_4 is halogen or lower alkoxy, amino, mono(lower alkyl)amino or di(lower alkyl) amino; and R_6 is carbamoyl, mono(lower alkyl)carbamoyl or di(lower alkyl)-carbamoyl and salts thereof.

2. The compound of claim 1 wherein said compound is 9-(6-Chloro-4-methoxy-2,5-dimethyl-phenyl)-3,7-dimethyl-nona-2,4,6,8-tetraen-1-oic acid ethyl amide.

4,107,191

13,14-DIDEHYDRO-PGF, COMPOUNDS

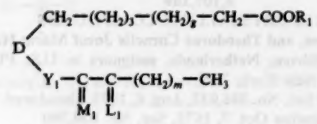
Herman W. Smith, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 658,588, Feb. 17, 1976, abandoned. This application Dec. 29, 1976, Ser. No. 755,337

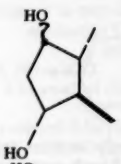
Int. Cl.[2] C07C *177/00*

U.S. Cl. 260—408 **106 Claims**

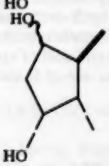
1. A prostaglandin analog of the formula



wherein D is



or



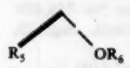
;

wherein

Y_1 is —C≡C—;

wherein g is one, 2, or 3, and m is one to 5;

wherein M_1 is



or

wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen;

wherein L_1 is

-continued

or a mixture of

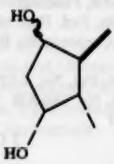
and

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, phenyl, phenyl substituted with two or three chloro, or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation;

with the proviso that R_5 is methyl, R_3 and R_4 are both hydrogen, and g is one, only when

wherein D is



4,107,192

ANTIMICROBIAL ESTERS OF ALIPHATIC DIOLS

August V. Bailey; Gordon J. Boudreaux; Gene Sumrell, all of New Orleans, and Arthur F. Novak, Baton Rouge, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 667,055, Mar. 15, 1976, Pat. No. 4,024,164. This application Feb. 15, 1977, Ser. No. 768,806

Int. Cl.[2] C09F *5/08*

U.S. Cl. 260—410.5 **5 Claims**

1. 2-Benzoxyethyl laurate.

4,107,193

POLYPRENYL CARBOXYLIC ACID COMPOUND

Shizumasa Kijima, Tokyo; Toshiji Igarashi, Tokorozawa; Isao Yamatsu, Tokyo; Kimio Hamamura, Kashiwa; Yoshikage Nakajima, Tokyo; Norio Minami, Kawasaki; Youji Yamagishi, and Yuithi Inai, both of Tokyo, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

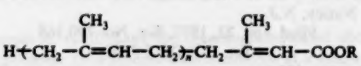
Filed May 13, 1977, Ser. No. 796,693

Claims priority, application Japan, May 27, 1976, 51/60583

Int. Cl.[2] C09F *5/08*; C11C *3/02*

U.S. Cl. 260—410 **18 Claims**

1. A polyprenyl carboxylic acid compound having the formula:



wherein R is hydrogen, alkyl, alkenyl, cycloalkyl or aryl, and

n is an integer of 6 to 11, and pharmacologically acceptable salts thereof.

10. A polyprenyl carboxylic acid compound as set forth in claim 1 wherein *n* is 9 and R is cyclohexyl.

4,107,194

PRODUCT AND PROCESS FOR REDUCING DISCOLORATION AND DARK SPOTTING IN TETRAFLUOROETHYLENE RESIN MOLDED PARTS

Satish Chandra Malhotra, Parkersburg, W. Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 645,220, Dec. 29, 1975, abandoned. This application Jan. 18, 1977, Ser. No. 760,395

Int. Cl.² C08K *3/08, 7/14*

U.S. Cl. 260—42.18 **7 Claims**

1. A mixture consisting essentially of comminuted granular tetrafluoroethylene resin that has been ground until it has a d_{50} of less than 200μ, particulate filler material, and an amount of a silicone effective to reduce discoloration and dark spotting upon sintering in an air-starved environment, said mixture being mixed in an apparatus for dry blending at a temperature between about 15° and 35° C.

4,107,195

PREPARATION OF ZEOLITE ZSM-35

Louis Deane Rollmann, Princeton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 22, 1977, Ser. No. 789,900

Int. Cl.² C07F *5/06;* C01B *33/28*

U.S. Cl. 260—448 C **19 Claims**

1. A synthetic crystalline aluminosilicate zeolite having a composition in the anhydrous state, expressed in terms of mole ratios of oxides as follows:

$$(0.3\text{–}5)R : (0\text{–}0.8)M_2O : Al_2O_3 : xSiO_2$$

wherein R is butanediamine or an organic nitrogen-containing cation derived therefrom, M is an alkali metal cation and *x* is greater than 8, and having an X-ray powder diffraction pattern substantially as that shown in Table 1 of the specification.

13. The method for preparing the crystalline aluminosilicate zeolite defined in claim 1 which comprises preparing a mixture containing sources of an alkali metal oxide, an organic nitrogen-containing oxide, an oxide of aluminum, an oxide of silicon and water and having a composition, in terms of mole ratios of oxides, falling within the following ranges:

SiO_2/Al_2O_3	=	8.8–200
H_2O/SiO_2	=	5–100
OH^-/SiO_2	=	10^{-10}–1.0
M/SiO_2	=	0.1–3.0
R/SiO_2	=	0.05–2.0

wherein R is butanediamine or an organic nitrogen-containing cation derived therefrom and M is an alkali metal ion, and maintaining the mixture at a temperature of at least 90° F until the crystals of said aluminosilicate are formed.

4,107,196

N-TERTIARYBUTYL ORGANOSILYLAMIDES

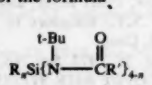
Cecil L. Frye, and Thomas H. Lane, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Dec. 7, 1977, Ser. No. 858,144

Int. Cl.² C07F *7/10*

U.S. Cl. 260—448.2 N **5 Claims**

1. A composition of the formula



where *n* is 2 or 3, R is of the group methyl, ethyl, vinyl, phenyl or 3,3,3-trifluoropropyl, at least 2 R's being methyl when *n* is 3 and R' is methyl or ethyl.

4,107,197

PROCESS FOR PREPARING α-OXY(OXO)SULFIDES AND ETHERS

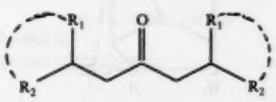
William J. Evers, Red Bank, and Howard H. Heinsohn, Jr., Hazlet, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 730,538, Oct. 7, 1976, Pat. No. 4,045,491. This application Mar. 31, 1977, Ser. No. 783,495

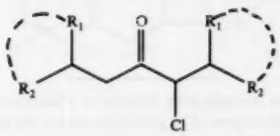
Int. Cl.² C07C *153/09*

U.S. Cl. 260—455 R **6 Claims**

1. The process comprising the steps of first reacting a ketone having the structure:



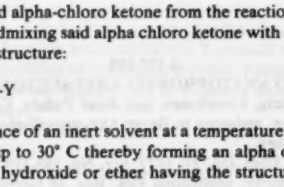
with SO_2Cl_2 at a temperature in the range of from 15° up to 40° C to form an alpha chloro ketone having the structure



distilling said alpha-chloro ketone from the reaction mass; then intimately admixing said alpha chloro ketone with a compound having the structure:

M—Z—Y

in the presence of an inert solvent at a temperature in the range of from 0° up to 30° C thereby forming an alpha oxo mercaptan, sulfide, hydroxide or ether having the structure:



and extracting said alpha oxo mercaptan, sulfide, hydroxide or ether from the reaction mass; wherein R_1 and R_2 can be taken together or separately; and when R_1 and R_2 are taken separately, R_1 is hydrogen or methyl and R_2 is methyl; and when R_1 and R_2 are taken together they form a phenyl moiety; M is alkali metal; Z is selected from the group consisting of oxygen and sulfur; and Y is one of hydrogen, C_1–C_4 alkyl, C_3 or C_4 alkenyl, acetyl, methoxy carbonyl methyl or 1,3-diethyl acetonyl.

4,107,198

CATALYTIC CODIMERIZATION OF NORBORNADIENE WITH ACRYLONITRILE

Harry K. Myers, Jr., Aston, and Abraham Schneider, Overbrook Hills, both of Pa., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Jul. 1, 1977, Ser. No. 812,208
Int. Cl.[2] C07C *120/00, 121/46*
U.S. Cl. 260—464 10 Claims

1. Process for the catalytic codimerization of norbornadiene with acrylonitrile comprising:

(a) contacting norbornadiene and acrylonitrile in the presence of a catalytic amount of a three-component homogeneous catalytic system consisting of nickel acetylacetonate, triphenylphosphine and an alkyl aluminum chloride selected from the group consisting of diethylaluminum chloride, ethyl aluminum dichloride and ethyl aluminum sesquichloride;

(b) having the contacting occurring at a temperature within the range between from about −20° C to about 100° C; and

(c) continuing the contacting until a norbornadiene-acrylonitrile codimer having the following structure

is prepared.

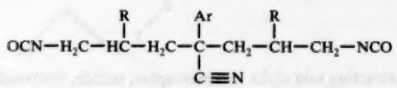
4,107,199

BIS(ISOCYANATOPROPYL) ARYLACETONITRILES

Eberhard König, Leverkusen, and Josef Pedain, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 27, 1977, Ser. No. 763,219
Claims priority, application Fed. Rep. of Germany, Feb. 7, 1976, 2604831
Int. Cl.[2] C07C *121/66*
U.S. Cl. 260—465 D 4 Claims

1. Diisocyanates of the formula



in which

Ar represents an aromatic hydrocarbon group having from 6 to 14 carbon atoms which may contain one or more substituents which are inert towards isocyanate groups and

R represents hydrogen or an aliphatic hydrocarbon group having from 1 to 4 carbon atoms.

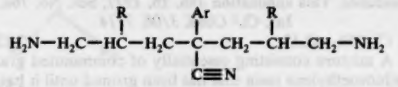
4,107,200

BIS(AMINOPROPYL) ARYLACETONITRILES AND PREPARATION THEREOF

Eberhard König, Leverkusen, and Josef Pedain, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 27, 1977, Ser. No. 763,218
Claims priority, application Fed. Rep. of Germany, Feb. 7, 1976, 2604794
Int. Cl.[2] C07C *121/78*
U.S. Cl. 260—465 E 10 Claims

1. Compounds of the formula



in which

Ar represents an aromatic hydrocarbon group having from 6 to 14 carbon atoms, which may carry one or more substituents which are inert towards amino groups and

R represents hydrogen or an aliphatic hydrocarbon group having from 1 to 4 carbon atoms.

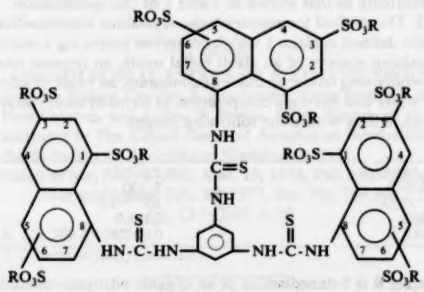
4,107,201

S-PHENENYLTRIS(THIOUREYLENE)TRINAPHTHALENETRISULFONIC ACID SALTS

Ransom Brown Conrow, Pearl River, and Seymour Bernstein, New City, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jun. 29, 1977, Ser. No. 811,100
Int. Cl.[2] C07C *143/60, 157/09;* A61K *31/185*
U.S. Cl. 260—506 2 Claims

1. A compound of the formula:



wherein R is a pharmaceutically acceptale salt cation.

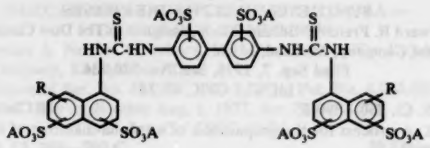
4,107,202

SUBSTITUTED 4,4'-BIPHENYLYLENE BIS(2-THIOUREYLENE)DI-NAPHTHALENETRISULFONIC ACIDS AND SALTS THEREOF

Ransom Brown Conrow, Pearl River, and Seymour Bernstein, New City, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Mar. 28, 1977, Ser. No. 782,211
Int. Cl.[2] C07C *143/60;* A61K *31/185;* C07C *143/66*
U.S. Cl. 260—506 4 Claims

1. A compound of the formula:



wherein R is selected from the group consisting of hydroxy and —SO_3A, and A is a pharmaceutically acceptable salt cation.

4,107,203

OPTICAL RESOLUTION OF DL-α-PHENYLGLYCINE HYDROCHLORIDE

Yasuhisa Tashiro, Yokohama; Hideo Sugimura, Tokyo; Toshiaki Arai, Washinomiya; Masao Suzuki, Tokyo, and Tadashi Shirai, Musashino, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 657,532, Feb. 12, 1976, abandoned. This application Aug. 8, 1977, Ser. No. 822,826

Claims priority, application Japan, Feb. 25, 1975, 50-23072

Int. Cl.² C07C *101/04*

U.S. Cl. 260—518 R **6 Claims**

1. A process for separating optically active D- or L-α-phenylglycine hydrochloride from a supersaturated aqueous solution of DL-α-phenylglycine hydrochloride which comprises adding seed crystals of D- or L-α-phenylglycine hydrochloride to said supersaturated solution in the presence of at least one metal chloride selected from the group consisting of zinc chloride, stannous chloride, stannic chloride, cadmium chloride and ferric chloride, and cooling to selectively induce crystallization of the corresponding optically active D- or L-α-phenylglycine hydrochloride and separating the crystals from the solution.

4,107,204

CATALYTIC OXIDATION OF ACROLEIN TO ACRYLIC ACID

Jawad H. Murib, Cincinnati, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 603,907, Aug. 11, 1975, Pat. No. 4,051,181. This application Jun. 9, 1977, Ser. No. 805,048

The portion of the term of this patent subsequent to Sep. 27, 1994, has been disclaimed.

Int. Cl.² C07C *51/32*

U.S. Cl. 260—530 N **8 Claims**

1. A vapor phase process which comprises oxidizing acrolein by reacting the acrolein with an oxygen containing gas at a temperature of 125°–320° C in the presence of a supported two-metal catalyst wherein one metal is palladium and the second metal is copper or silver, and recovering acrylic acid.

4,107,205

α-ARYL-α,α-BIS[ω-(DISUBSTITUTED AMINO)ALKYL]ACETAMIDES AND RELATED COMPOUNDS

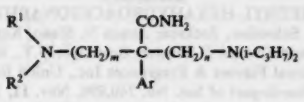
Jerry J. Renbarger, Arlington Heights, and Peter K. Yonan, Morton Grove, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Mar. 11, 1977, Ser. No. 776,563

Int. Cl.² A61K *31/165*; C07C *103/28*

U.S. Cl. 260—558 A **8 Claims**

1. A compound of the formula



and the non-toxic pharmacologically acceptable acid addition salts thereof; wherein R^1 is lower alkyl having from 1 to 7 carbon atoms or cycloalkyl having 5 or 6 carbon atoms; R^2 is lower alkyl having from 1 to 7 carbon atoms; Ar is phenyl, trifluoromethylphenyl or phenyl substituted with 1 or 2 halogen or lower alkyl having from 1 to 4 carbon atoms; and *m* and *n* are each integers from 2 to 4 inclusive.

4,107,206

BENZO-BICYCLONONENE- DERIVATIVES

Colin Leslie Hewett, and David Samuel Savage, both of Glasgow, Scotland, assignors to Akzona Incorporated, Asheville, N.C.

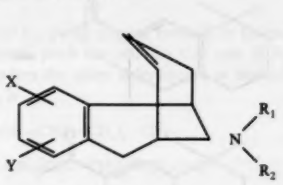
Continuation-in-part of Ser. No. 563,435, Mar. 31, 1975, Pat. No. 4,008,277. This application Oct. 26, 1976, Ser. No. 735,286

Claims priority, application United Kingdom, Apr. 8, 1974, 15.558/74

Int. Cl.² C07C *103/10*

U.S. Cl. 260—562 R **12 Claims**

1. A compound of the formula



and pharmaceutically acceptable salts thereof, in which R_1 is selected from the group consisting of hydrogen or alkyl hydrocarbons of 1 to 6 carbon atoms and R_2 is an acyl group derived from an aliphatic carboxylic acid of from about 1 to 18 carbon atoms, or an araliphatic or aromatic carboxylic acid of from about 7 to 18 carbon atoms and X and Y are each selected from the group consisting of hydrogen, hydroxy, halogen, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, nitro and trifluoromethyl.

4,107,207

MIXED METAL AMIDE CATALYSTS FOR H-D EXCHANGE IN AMINES

John M. Holmes, Sarnia, Canada, assignor to Atomic Energy of Canada Limited, Ottawa, Canada

Filed Aug. 1, 1977, Ser. No. 820,876

Claims priority, application Canada, Aug. 3, 1976, 258321

Int. Cl.² C07C *83/00*

U.S. Cl. 260—583 R **17 Claims**

1. In a process for catalyzed H-D exchange between hydrogen and an amine in a deuterium enrichment process, the improvement comprising utilizing as catalyst in the amine phase a dissolved composite amide including both Group I metal and Group II metal amides, the composite catalyst being selected to provide at least one of an increased H-D exchange rate or prolonged activity over that of the single Group I metal amide.

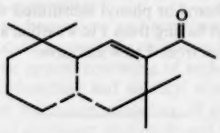
4,107,208

TETRAMETHYL-HEXAHYDROACETONAPHTHONES

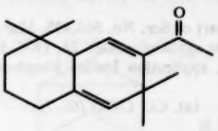
William L. Schreiber, Jackson; James N. Siano, Keyport, both of N.J., and Edward J. Shuster, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., Union Beach, N.J.

Continuation-in-part of Ser. No. 740,890, Nov. 11, 1976, Pat. No. 4,076,749. This application Sep. 19, 1977, Ser. No. 834,500
Int. Cl.[2] C07C *49/61*
U.S. Cl. 260—586 F 2 Claims

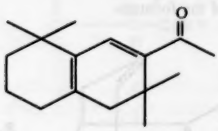
1. A mixture of compounds defined by the structure:



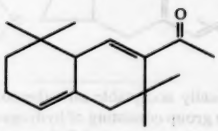
wherein one of the dashed lines is a carbon-carbon double bond, and each of the other of the dashed lines is a carbon-carbon single bond, said mixture consisting essentially of compounds having the structures:



;



; and



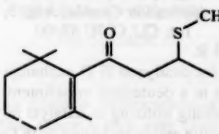
4,107,209

1-[3-(METHYLTHIO)BUTYRYL]-2,6,6-TRIMETHYL-CYCLOHEXENE AND THE 1,3-CYCLOHEXADIENE ANALOG

Richard A. Wilson, Westfield; Braja Dulal Mookherjee, Holmdel; Anne Sanderson Hruza, Brick Town; Manfred Hugo Vock, Locust; Louis Schmitt Frederick, Holmdel, and Joaquin Francisco Vinals, Red Bank, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Mar. 3, 1977, Ser. No. 774,055
Int. Cl.[2] C07C *49/61*
U.S. Cl. 260—586 R 3 Claims

1. A substantially pure, synthetically produced 1-[3-(methylthio)butyryl]-2,6,6-trimethyl-cyclohexene or the 1,3-cyclohexadiene analog defined by the structure:



wherein the dashed line is a carbon-carbon single bond or a carbon-carbon double bond.

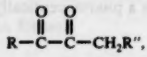
4,107,210

SYNTHESIS OF ALPHA-DIKETONES

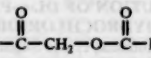
Edward R. Freiter, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 7, 1976, Ser. No. 720,934
Int. Cl.[2] C07C *45/18*
U.S. Cl. 260—590 E 18 Claims

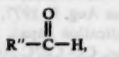
1. A process for the preparation of an alpha-diketone of the formula,



comprising contacting an acylmethyl ester of the formula,

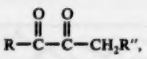


with an aldehyde of the formula,

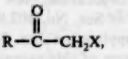


in the presence of an amount of acid catalyst and an amount of water and under reaction conditions, which amounts and conditions are sufficient to cause reaction of the ester with the aldehyde to form the diketone, wherein the aforementioned formulas R is an alkyl, cycloalkyl or aryl radical; an inertly substituted alkyl, cycloalkyl, or aryl radical; or a combination thereof; and R′ and R″ are individually hydrogen or a radical as specified for R.

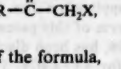
4. A process for the preparation of an alpha-diketone of the formula,



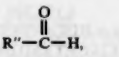
comprising (a) an initial process step which comprises reacting an alpha-haloketone of the formula,



with a carboxylic acid of the formula,



or a salt thereof and (b) a second process step which comprises reacting the reaction mixture resulting from the initial process step with an aldehyde of the formula,



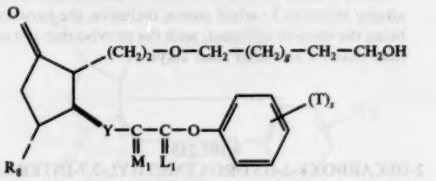
under conditions, and in the presence of amounts of an acid catalyst and water, which amounts and conditions are sufficient to cause formation of the alpha-diketone; wherein in the aforementioned formulas R is an alkyl, cycloalkyl, or aryl radical; an inertly substituted alkyl, cycloalkyl, or aryl radical; or a combination thereof; and R′ and R″ are individually hydrogen or a radical as specified for R.

4,107,211
2-DECARBOXY-2-HYDROXY-METHYL-5-OXA-ω-PHENOXY-PGE$_1$ COMPOUNDS

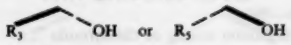
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 647,357, Jan. 8, 1976, Pat. No. 4,055,602.
This application Aug. 5, 1977, Ser. No. 822,300
Int. Cl.[2] C07C *49/84*
U.S. Cl. 260—590 C 29 Claims

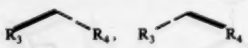
1. A prostaglandin analog of the formula



wherein R_8 is hydrogen or hydroxy;
wherein Y is trans-CH=CH—;
wherein M_1 is



wherein R_5 is hydrogen or hydroxy;
wherein L_1 is



or a mixture of

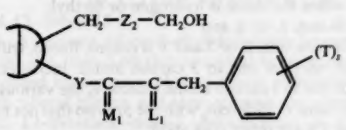
wherein R_3 and R_4 are hydrogen or methyl, being the same or different;
wherein *g* is one, 2, or 3; and
wherein *s* is zero, one, 2, or 3 and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl.

4,107,212
2-DECARBOXY-2-HYDROXYMETHYL-ω-PHENYL-PGA OR 9-DEOXY-9,10-DIDEHYDRO-PGD ANALOGS

Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

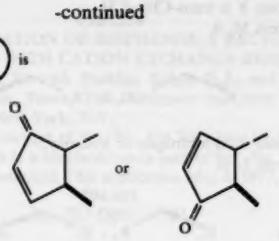
Division of Ser. No. 647,357, Jan. 8, 1976, Pat. No. 4,055,602.
This application Aug. 5, 1977, Ser. No. 822,033
Int. Cl.[2] C07C *49/82*
U.S. Cl. 260—590 C 119 Claims

1. A prostaglandin analog of the formula

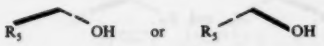


-continued

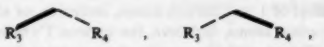
wherein D is



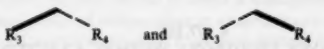
wherein Y is trans—CH=CH—;
wherein M_1 is



wherein R_5 is hydrogen or methyl;
wherein L_1 is



or a mixture of



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl;
wherein Z_2 is

cis-CH=CH—CH_2—$(CH_2)_g$—CF_2—;

cis-CH_2—CH=CH—$(CH_2)_g$—CH_2—; or

—$(CH_2)_3$—$(CH_2)_g$—CF_2—;

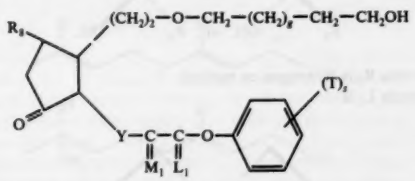
wherein *g* is one, 2, or 3; and
wherein *s* is zero, one, 2, or 3 and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl.

4,107,213
2-DECARBOXY-2-HYDROXY-METHYL-5-OXA-ω-PHENOXY-PGD$_1$ COMPOUNDS

Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

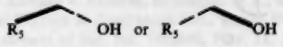
Division of Ser. No. 647,357, Jan. 8, 1976, Pat. No. 4,055,602.
This application Aug. 5, 1977, Ser. No. 822,302
Int. Cl.[2] C07C *49/84*
U.S. Cl. 260—590 C 29 Claims

1. A prostaglandin analog of the formula

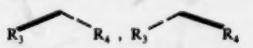


wherein R_8 is hydrogen or hydroxy;

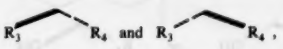
wherein Y is trans-CH=CH—;
wherein M_1 is



wherein R_5 is hydrogen or hydroxy;
wherein L_1 is



or a mixture of



wherein R_3 and R_4 are hydrogen or methyl, being the same or different;
wherein *g* is 1, 2, or 3; and
wherein *s* is 0, 1, 2, or 3 and T is chloro, fluoro, trifluoromethyl, alkyl of 1 to 3 carbon atoms, inclusive, or alkoxy of 1 to 3 carbon atoms, inclusive, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl.

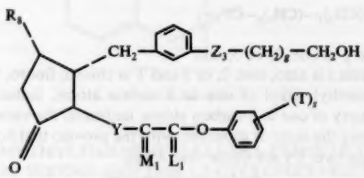
4,107,214

2-DECARBOXY-2-HYDROXY-METHYL-3,7-INTER-M-PHENYLENE-ω-PHENOXY-PGD$_1$ COMPOUNDS

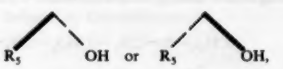
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 647,357, Jan. 8, 1976, Pat. No. 4,055,602. This application Aug. 5, 1977, Ser. No. 822,027
Int. Cl.[2] C07C *49/82, 49/84*
U.S. Cl. 260—590 C **29 Claims**

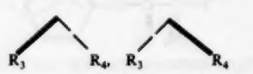
1. A prostaglandin analog of the formula



wherein
Z_3 is oxa or methylene;
wherein
R_8 is hydrogen or hydroxy;
wherein
Y is trans-CH=CH-;
wherein
M_1 is



wherein R_5 is hydrogen or methyl;
wherein L_1 is



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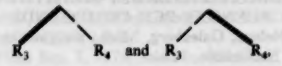


wherein R_3 and R_4 are hydrogen or methyl, being the same or different;
wherein *g* is one, 2, or 3; and
wherein *s* is zero, one, 2 or 3 and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl.

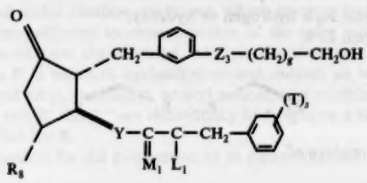
4,107,215

2-DECARBOXY-2-HYDROXYMETHYL-3,7-INTER-M-PHENYLENE-ω-PHENYL-PGE$_1$ COMPOUNDS

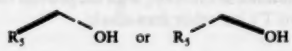
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 647,357, Jan. 8, 1976, Pat. No. 4,055,602. This application Aug. 5, 1977, Ser. No. 822,031
Int. Cl.[2] C07C *49/82, 49/84*
U.S. Cl. 260—590 C **39 Claims**

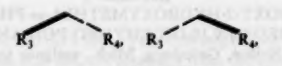
1. A prostaglandin analog of the formula



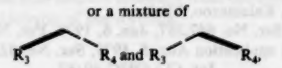
wherein
Z_3 is oxa or methylene;
wherein
R_8 is hydrogen or hydroxy;
wherein
Y is trans-CH=CH-;
wherein
M_1 is



wherein
R_5 is hydrogen or methyl;
wherein L_1 is



or a mixture of



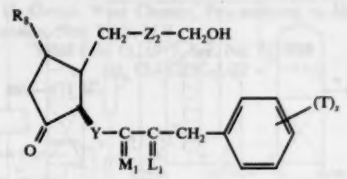
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl;
wherein *g* is one, 2, or 3; and
wherein *s* is zero, one, 2, or 3 and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl.

4,107,216
2-DECARBOXY-2-HYDROXY-METHYL-ω-PHENYL-PGD ANALOGS

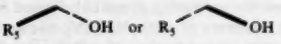
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 647,357, Jan. 8, 1976, Pat. No. 4,055,602. This application Aug. 5, 1977, Ser. No. 822,034
Int. Cl.[2] C07C *49/84*
U.S. Cl. 260—590 C 119 Claims

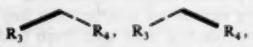
1. A prostaglandin analog of the formula



wherein R_8 is hydrogen or hydroxy;
wherein Y is trans-CH=CH—;
wherein M_1 is



wherein R_5 is hydrogen or methyl;
wherein L_1 is



or a mixture of

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl;
wherein Z_2 is cis-CH=CH—CH_2—$(CH_2)_g$—CF_2—; cis-CH_2—CH=CH—$(CH_2)_g$—CH_2—; or —$(CH_2)_3$—$(CH_2)_g$—CF_2—;
wherein *g* is one, 2, or 3; and
wherein *s* is zero, one, 2, or 3 and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl.

4,107,217
ACETALS OF CONJUGATED ALKENALS

William L. Schreiber, Jackson, and Alan O. Pittet, Atlantic Highlands, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

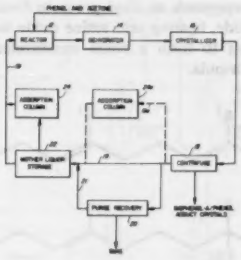
Continuation-in-part of Ser. No. 713,471, Jul. 11, 1976, abandoned, which is a continuation of Ser. No. 597,189, Jul. 18, 1975, abandoned, which is a division of Ser. No. 383,579, Jul. 30, 1973, Pat. No. 3,922,309. This application May 26, 1977, Ser. No. 800,890
Int. Cl.[2] C07C *43/30*; A61K *7/46*
U.S. Cl. 260—615 A 2 Claims

1. A mixture of cis-2-ethylidene-trans-3-hexenal dimethyl acetal and trans-2-ethylidene-trans-3-hexenal dimethyl acetal produced by reacting ethyl triphenyl phosphonium bromide with n-butyl lithium and then reacting the resulting product with 1,1-dimethoxy-trans-3 -hexane-2-one at a temperature below 30° C.

4,107,218
DECOLORATION OF BISPHENOL-A RECYCLE STREAM WITH CATION EXCHANGE RESIN

Frederick Miller Konrad, Basking Ridge, N.J., and Stephen Howard Mason, Ponce, P.R., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 696,726, Jun. 16, 1976, abandoned, which is a continuation-in-part of Ser. No. 616,026, Sep. 23, 1975, abandoned. This application May 6, 1977, Ser. No. 794,419
Int. Cl.[2] C07C *37/22*
U.S. Cl. 560—724 4 Claims



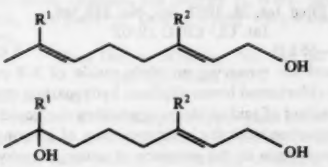
1. A process for removing color bodies from 4,4'-bisphenol-A process recycle stream wherein a stoichiometric excess of phenol is reacted with acetone in a reaction mixture containing an acid catalyst to produce a product mixture containing phenol and 4,4'-bisphenol-A, wherein said product mixture is separated into a 4,4'-bisphenol-A/phenol adduct and a mother liquor recycle stream, wherein said mother liquor recycle stream is recycled to said reaction mixture, wherein at least a portion of said mother liquor recycle stream is contacted with an adsorbent comprising a substantially insoluble acidic cationic exchange resin for a period of time and at a temperature sufficient to reduce the content of color bodies contained in said mother liquor recycle stream, said temperature being within the range of from about 40° to about 150° C., prior to recycling said mother liquor to said reaction mixture, wherein said absorbent is periodically washed with a phenol/water mixture to remove absorbed color bodies therefrom, and wherein the water content of said absorbent is substantially in equilibrium with the water content of said mother liquor recycle stream.

4,107,219
PROCESS FOR PRODUCING CHAIN TERPENE ALCOHOL

Atsuo Murata; Shuji Tsuchiya; Hideo Suzuki, and Hisao Ikeda, all of Funabashi, Japan, assignors to Nissan Chemical Industries Ltd., Tokyo, Japan

Filed May 11, 1977, Ser. No. 795,789
Claims priority, application Japan, May 14, 1976, 51-54941
Int. Cl.[2] C07C *29/00*
U.S. Cl. 568—875 7 Claims

1. A process for producing a chain terpene alcohol having the formula:

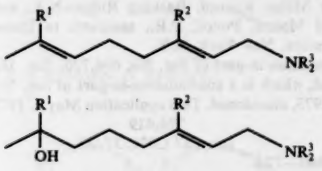


(I)

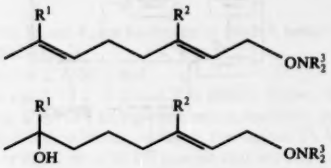
(II)

wherein R^1 and R^2 are the same or different and respectively represent hydrogen atom or a lower alkyl group which com-

prises oxidizing a chain unsaturated amine having the formula:



wherein R^3 represents an alkyl group to form the corresponding amine oxide, heating said amine oxide to effect a thermal rearrangement to form a chain unsaturated hydroxylamine having the formula:



and then, reducing the chain unsaturated hydroxylamine with hydrogen in the presence of a catalyst selected from the group consisting of metallic iron, cobalt, nickel, copper, oxides thereof, and copper chromite.

4,107,220

GAS PHASE NITRATION OF CHLOROBENZENE

Dennis C. Owsley, St. Louis, and Jordan J. Bloomfield, Creve Coeur, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 4, 1977, Ser. No. 848,547
Int. Cl.² C07C *79/12*
U.S. Cl. 260—646 **7 Claims**

1. A method for the production of a nitrochlorobenzene mixture in which the para:ortho isomer distribution can be readily controlled to predetermined relative proportions within a broad range comprising the vapor phase nitration of chlorobenzene with a nitrating agent in the presence of a molecular sieve catalyst having a relatively small pore size ranging from about 5 Å to about 10 Å.

4,107,221

REMOVAL OF OLEFIN OXIDE FROM CHLORINATED SOLVENTS

William D. Tasto, and Thomas E. Morris, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 28, 1977, Ser. No. 819,749
Int. Cl.² C07C *19/02*
U.S. Cl. 260—652 P **6 Claims**

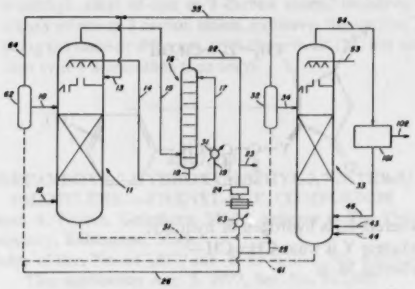
1. A method for removing an olefin oxide of 3–8 carbon atoms from a chlorinated lower aliphatic hydrocarbon containing a small amount of said oxide by contacting the liquid chlorinated hydrocarbon with the hydrogen form of a strong acid cation exchange resin in the presence of water, thereby converting said olefin oxide to the corresponding diol, and washing the resin periodically with water, thereby separating accumulated diol from the resin.

4,107,222

OXYCHLORINATION OF METHANE

Morgan C. Sze, Upper Montclair; Herbert Riegel, Maplewood, and Harvey D. Schindler, Paterson, all of N.J., assignors to The Lummus Company, Bloomfield, N.J.

Continuation of Ser. No. 299,848, Oct. 24, 1972, abandoned.
This application Nov. 11, 1975, Ser. No. 631,157
Int. Cl.² C07C *17/00*
U.S. Cl. 260—659 A **7 Claims**



1. A process for producing as net chlorinated methane reaction product a mixture of methylene chloride and chloroform, without essential net production of carbon tetrachloride, comprising:

(a) contacting in an oxidation reaction zone a molten salt mixture of cuprous and cupric chloride with molecular oxygen to produce copper oxychloride;

(b) contacting molten salt mixture from step (a) in an oxychlorination reaction zone with fresh feed methane and chlorine to effect oxychlorination of the methane with oxygen requirements for the oxychlorination being provided by the oxychloride of the molten salt mixture, said contacting being effected at a temperature of from about 700° to about 860° F, at a methane conversion from about 25 to 50 mole percent and in the presence of carbon tetrachloride in an amount to provide tetrachloride to methane mole ratio of at least about 0.2:1 to essentially eliminate net production of carbon tetrachloride;

(c) withdrawing from the oxychlorination reaction zone an effluent containing unreacted methane, methyl chloride, methylene chloride, chloroform and carbon tetrachloride;

(d) recovering as net product, from the effluent, chloroform and at least a portion of the methylene chloride;

(e) recycling to the oxychlorination reaction zone unreacted methane, methyl chloride and any remaining methylene chloride recovered from the effluent; and

(f) passing the molten salt mixture from the oxychlorination reaction zone to the oxidation reaction zone.

4,107,223

PROCESS FOR IMPROVING THE LOW TEMPERATURE PROPERTIES OF TETRAHYDROALKYLDICYCLOPENTADIENES

Abraham Schneider, Overbrook Hills, and Richard E. Ware, Aston, both of Pa., assignors to Suntech, Inc., St. Davids, Pa.

Filed Sep. 3, 1976, Ser. No. 720,305
Int. Cl.² C07C *5/24*
U.S. Cl. 260—666 PY **9 Claims**

1. Process for isomerizing endo-tetrahydroalkyldicyclopentadienes comprising:

(a) contacting an endo-tetrahydroalkyldicyclopentadiene selected from the group consisting of endo-tetrahydromethyldicyclopentadiene, endo-tetrahydrodimethyldicyclopentadiene, and a mixture of the foregoing, with anhydrous aluminum trichloride wherein the mole ratio of the trichloride to the endo-tetrahydroalkyldicyclopentadiene is in the range between from about 0.001 to about 0.5 and

temperature of the contacting is in the range between from about 0° C to about 100° C;

(b) continuing contacting until resulting isomeric mixture of tetrahydroalkydiene has a kinematic viscosity and a pour point making it useful as diluent for high energy missile fuel; and

(c) recovering the isomeric tetrahydroalkydiene.

4,107,224

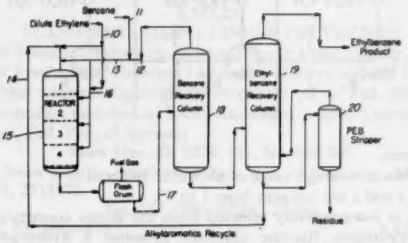
MANUFACTURE OF ETHYL BENZENE

Francis G. Dwyer, West Chester, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 11, 1977, Ser. No. 767,855

Int. Cl.² C07C 3/52

U.S. Cl. 260—671 R **4 Claims**



1. In a process for effecting ethylation of an alkylatable aromatic hydrocarbon compound by contacting said compound with ethylene under conversion conditions of 250 to 600° C., a pressure between about 0.1 and about 100 atmospheres, a feed weight hourly space velocity between about 0.1 and about 100 and a molar feed ratio of said compound to ethylene between about 1 and about 30 in the presence of a crystalline aluminosilicate zeolite having a silica to alumina ratio of at least about 12 and a constraint index within the approximate range of 1 to 12 in a series of beds of said zeolite wherein effluent of each such bed except the last is admixed with fresh reactant supplied at a temperature lower than that of said effluent and the so-quenched reaction mixture is passed to the next such bed; the improvement comprises supplying charge to the first said bed and fresh reactants to said effluents as a mixture consisting essentially of said alkylatable aromatic hydrocarbon compound and ethylene admixed with at least an equi-molar amount of inert hydrocarbon diluent consisting essentially of methane, ethane or a mixture of the same whereby to increase the partial pressure driving force to desorb coke precursors from the catalyst surface.

4,107,225

HYDROGENATION PROCESS OF OLEFIN POLYMERS FOR PRODUCING WHITE OILS

Guy F. S. Debande, Watermael; Raymond N. M. Cahen, Etterbeek, and Jacques F. J. Grootjans, Leefdael, all of Belgium, assignors to Labofina S.A., Brussels, Belgium

Filed Mar. 15, 1977, Ser. No. 777,908

Claims priority, application Luxembourg, Mar. 16, 1976, 74571

Int. Cl.² C07C 5/14

U.S. Cl. 260—683.9 **13 Claims**

1. A process for hydrogenating a liquid polymer derived from olefin units containing 4 carbon atoms, which comprises the step of hydrogenating said polymer at a hydrogen pressure of between about 40 and about 120 kg/cm² and at a temperature of between about 200° and about 250° C in the presence of a catalyst comprising platinum on an alumina support exhibiting a total pore volume of at least about 0.25 ml/g, wherein about 90 to about 98% of said pore volume is provided by pores having a pore size distribution lower than 100A.

4,107,226

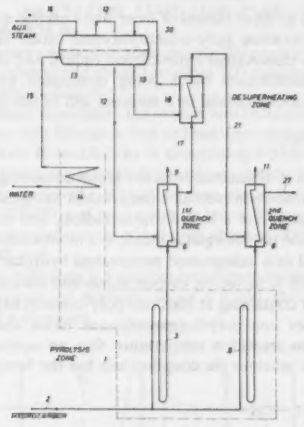
METHOD FOR QUENCHING CRACKED GASES

Bernard P. Ennis, Jr., and James R. Styslinger, both of Houston, Tex., assignors to Pullman Incorporated, Chicago, Ill.

Filed Oct. 19, 1977, Ser. No. 843,462

Int. Cl.² C07C 3/08

U.S. Cl. 260—683 R **12 Claims**



1. A process for quenching cracked gases obtained by steam cracking a hydrocarbon fraction in a pyrolysis zone to produce olefins and the recovery of heat therefrom comprising:

quenching cracked gases in a quench zone by indirect heat exchange with steam to increase the superheat thereof and desuperheating steam having increased superheat in a desuperheating zone by indirect heat exchange with water to recover heat in the form of steam at an elevated pressure.

8. A process for quenching cracked gases obtained by steam cracking a hydrocarbon fraction in a pyrolysis zone to produce olefins and the recovery of heat therefrom comprising:

a. quenching cracking gases in at least two quench zones with steam to increase the superheat thereof wherein steam entering the first quench zone is saturated steam;

b. desuperheating steam having increased superheat in at least one desuperheating zone by indirect heat exchange with water to recover heat in the form of saturated steam at a pressure of from about 500 psia. to about 3100 psia.;

c. passing desuperheated steam to a second quench zone to quench cracked gases by indirect heat exchange thereby increasing the superheat of said desuperheated steam; and

d. recovering the superheated steam from the second quench zone.

4,107,227

METHOD FOR PREPARING IMPROVED POLYALPHAMETHYLS TYRENE-POLYDIORGANOSILOXANE BLOCK COPOLYMERS AND PRODUCTS THEREOF

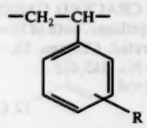
John C. Saam, Midland, and Andrew H. Ward, Sanford, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Dec. 9, 1976, Ser. No. 748,788

Int. Cl.² C08L 83/10

U.S. Cl. 260—827 **11 Claims**

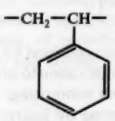
1. A method of increasing the upper glass transition temperature of a poly-α-methylstyrene-polydiorganosiloxane block copolymer, said method comprising coupling at least one poly-α-methylstyrene block with at least one polydiorganosiloxane block through at least one coupling unit of the formula



where R is an alkyl radical of from 1 to 4 carbon atoms, inclusive, any terminal poly-α-methylstyrene block being terminated by a monovalent hydrocarbon radical and any terminal polydiorganosiloxane block being terminated by a silicon-bonded hydroxy radical or a siloxane unit of the formula

$$R'_3SiO_{1/2}$$

where each R′ is selected from the group consisting of a monovalent hydrocarbon radical, a monovalent halogenated hydrocarbon radical and a hydrolyzable radical, and each organic radical of the polydiorganosiloxane is a monovalent hydrocarbon radical or a halogenated monovalent hydrocarbon radical of from 1 to 6, inclusive, carbon atoms and obtaining a block copolymer containing at least one poly-α-methylstyrene block and at least one polydiorganosiloxane block and having a higher glass transition temperature than an equivalent block copolymer wherein the coupling unit has the formula



4,107,228

UNIVERSAL PAINT COMPOSITION AND OBJECTS COATED THEREWITH

Carl Horowitz; Michael Dichter, both of Brooklyn; Mangara J. Duryodhan, Staten Island, and Joseph A. Ioria, Ozone Park, all of N.Y., assignors to Gulf & Western Manufacturing Company, New York, N.Y.

Continuation of Ser. No. 544,282, Jan. 27, 1975, abandoned. This application Dec. 29, 1976, Ser. No. 755,165

Int. Cl.[2] C08L *63/10*

U.S. Cl. 260—836 **15 Claims**

1. A heat-curable paint composition comprising as ingredients:

(a) a polymerizable vinyl monomer, said vinyl monomer having at least one functional group in addition to the vinyl group;

(b) a polyurethane resin, said polyurethane resin including reactive-NCO-groups and being derived from the reaction of a polyester or polyether with an aliphatic diisocyanate and vulcanized through the isocyanate group by reaction with a material selected from the group consisting of glycols, diamines, diacids or amino alcohols;

(c) an epoxy resin prepolymer, said epoxy resin prepolymer having more than one epoxy group per molecule;

(d) an epoxy resin hardening agent;

(e) a peroxide polymerization initiator; and

(f) a source of silver ions;

said ingredients being dissolved in a solvent system, said paint composition being heat-curable by exposure to temperatures in the range of 150° to 300° F. for periods ranging from 15 minutes to 2 hours.

4,107,229

POLYURETHANE ACRYLATES OF HYDROXYALKYLATED NOVOLAC RESIN

Richard B. Tideswell, Buffalo, and Jeffrey E. Selley, East Amherst, both of N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Jun. 7, 1976, Ser. No. 693,815

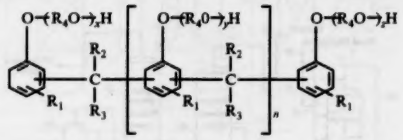
Int. Cl.[2] C08G *18/00*

U.S. Cl. 260—841 **32 Claims**

1. A vinyl terminated, thermosetting polyurethane composition comprising the reaction product of:

(A) an organic polyisocyanate;

(B) an hydroxyalkylated novolac characterized by the formula:



wherein

n has an average value of about 0.2 to about 6;

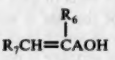
x, y and z are integers from 1 to 25;

R_1 is independently selected from the group consisting of hydrogen, fluorine chlorine, bromine, a hydrocarbon radical, a halogen substituted hydrocarbon radical; a hydrocarbon ketone radical, and a hydrocarbon carboxylic radical;

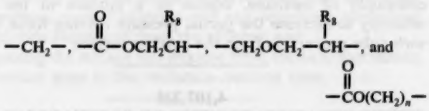
R_2 and R_3 are independently selected from the group consisting of hydrogen, a hydrocarbon radical, and a halogen substituted hydrocarbon radical; and

R_4 is a hydrocarbon radical; and

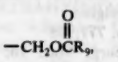
(C) a monohydric ethylenically unsaturated alcohol characterized by the formula:

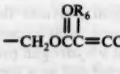


wherein R_6 is —H, or $—CH_3$; R_7 is —H, $—CH_3$, or $—C_6H_5$; and A is a divalent organic radical selected from the group consisting of:



wherein n is 3 to about 12, and R_8 is —H, $—(CH_2)_m—CH_3$,





CH_2OR_9, or $—CH_2OCH_2CH—CHR_7$ wherein m is an integer from zero to 10 and R_9 is a phenyl or halogenated phenyl radical, alkyl or halogenated alkyl radical having from 2 to 4 carbon atoms, benzoxy or halogenated benzoxy radicals, phenoxy or halogenated phenoxy radical.

4,107,230

FLAME-RETARDANT THERMOSETTING RESINOUS COMPOSITIONS

Roy G. Turnbo, Deer Park, Tex., and David C. Purpi, Woodcliff Lake, N.J., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed May 8, 1974, Ser. No. 467,884
Int. Cl.[2] C08K 5/02
U.S. Cl. 260—861 17 Claims

1. A flame-retardant resinous composition that comprises a thermoset organic polymer and a flame-retarding amount of 1,1,2,3,4,4-hexabromobutene-2.

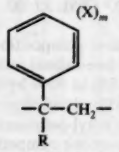
4,107,231

FLAME-RETARDANT LINEAR POLYESTERS

Rolf Wurmb, Heidelburg; Wolfgang Seydl; Klaus Penzien, both of Frankenthal; Hermann Gausepohl, Mutterstadt, and Hans-Josef Sterzel, Dannstadt-Schauernheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 23, 1976, Ser. No. 669,740
Claims priority, application Fed. Rep. of Germany, Apr. 9, 1975, 2515473
Int. Cl.[2] C08L 67/06, 25/06
U.S. Cl. 260—873 8 Claims

1. Linear polyesters flame-proofed with halogenous flame-proofing agents and synergists and optionally containing fillers and reinforcing fibers, the flame-proofing agents being halogenated oligomeric styrenes of the formula I



(I)

where x denotes halogen, R denotes hydrogen or an aliphatic radical, n is an integer of from 3 to 20 and m is an integer of from 1 to 5.

4,107,232

FLAME RETARDANT, NON-DRIPPING COMPOSITIONS OF POLYPHENYLENE ETHER AND ACRYLONITRILE-BUTADIENE-STYRENE

William Robert Haaf, Voorhesville, N.Y., and Donald Lewis Reinhard, Lenox, Mass., assignors to General Electric, Pittsfield, Mass.

Division of Ser. No. 530,373, Dec. 6, 1974. This application Dec. 22, 1975, Ser. No. 642,981
Int. Cl.[2] C03L 51/00
U.S. Cl. 260—876 R 5 Claims

1. A flame retardant, non-dripping thermoplastic molding composition which comprises:

a. a normally flammable copolymer of acrylonitrile-butadiene-styrene;

b. a halogenated flame retardant additive in a minor proportion based on said thermoplastic molding composition but in an amount sufficient to render said thermoplastic composition non-burning or self-extinguishing; and

c. a polytetrafluoroethylene resin in a minor proportion based on said thermoplastic molding composition in an amount at least sufficient to render said thermoplastic molding composition non-dripping.

4,107,233

BLOCK COPOLYMER BLEND WITH CERTAIN ACRYLICS

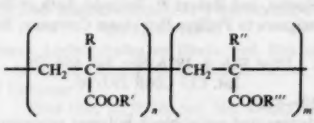
David R. Hansen, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Aug. 30, 1976, Ser. No. 718,996
The portion of the term of this patent subsequent to Feb. 13, 1994, has been disclaimed.
Int. Cl.[2] C08L 51/00, 27/00, 75/00
U.S. Cl. 260—876 B 10 Claims

1. A polymer composition comprising 100 parts by weight of a block copolymer and about 1 to about 100 parts by weight of an acrylic resin wherein:

(a) said block copolymer has at least two monoalkenyl arene polymer end blocks A and at least one conjugated diene mid block B, said blocks A comprising 8-55% by weight of the block copolymer, each polymer block A having an average molecular weight of between about 5,000 and about 125,000, and each polymer block B having an average molecular weight of between about 10,000 and about 300,000; and

(b) said acrylic resin is a random copolymer having an inherent viscosity of between about 0.1 and about 0.4, and having a structure



where R, R′, R″, and R‴ are selected from the group consisting of hydrogen and C_1 to C_4 alkyls, R′ differs from R‴, and the ratio of n to m varies from about 1 to 8.

4,107,234

ABS COMPOSITION HAVING IMPROVED IMPACT STRENGTH AND WEATHER AGING RESISTANCE AND LATEX SUSPENSION PROCESS THEREFOR

Robert J. Cornell, Naugatuck, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Filed Mar. 21, 1975, Ser. No. 560,783
Int. Cl.[2] G08L 55/02
U.S. Cl. 260—876 R 11 Claims

1. A composition consisting essentially of a polyblend of

(a) a matrix of a copolymer of about 60–80% of a monovinylidenic aromatic hydrocarbon and about 20–40% of an alkenoic nitrile monomer; and

(b) a graft copolymer comprising a graftable rubber substrate, said substrate comprising a mixture of (1) about 50–95% of a cross-linked styrene-butadiene small particle size or large particle size rubber spine wherein the ratio of styrene to butadiene is from about 31/69 to 0/100, the degree of cross-linking thereof being about 50–98%; and said rubber spine being pregrafted with a monoethylenically unsaturated monovinylidenic aromatic or alkenoic nitrile monomer or mixtures thereof, and (2) about 5–50% of a low-gel elastomer selected from the group consisting of styrene/butadiene rubber wherein the ratio of styrene to butadiene is from 31/69 to 0/100 and acrylonitrile/-butadiene rubber wherein the ratio of acrylonitrile to butadiene is from about 15/85 to 50/50; and having grafted onto said substrate, a superstrate which is a copolymer of about 60–80% of a monovinylidenic aromatic hydrocarbon and about 20–40% of an alkenoic nitrile monomer, the ratio of the total copolymer, including the grafted copolymer and the copolymer constituting the matrix, to the spine being about 95/5 to 55/45, the degree of grafting which is defined as the ratio of the weight of the grafted copolymer to the weight of the substrate being between about 0.2 and 1.0.

4,107,235

HIGH IMPACT RESISTANT ACRYLIC COATING COMPOSITIONS AND COATED ARTICLES

Walter Groesbeck DeWitt, III, Southampton, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 352,157, Apr. 18, 1973, abandoned. This application Oct. 20, 1977, Ser. No. 844,011

Int. Cl.[2] C08K *5/01, 5/05, 5/07, 5/10*

U.S. Cl. 260—876 R 4 Claims

1. A composition for coating a substrate comprising an acrylic solution polymer polymerized from a monomer system comprising one or more lower alkyl methacrylates and acrylates and having a molecular weight of about 30,000 to 250,000 and a Tg above 65° F., a solvent therefor, and a compatible acrylic polymer having a Tg less than −20° F. comprising a poly(butyl acrylate), wherein the weight ratio of said acrylic solution polymer to said compatible acrylic polymer is about 10:1 to 1:10.

4,107,236

HYDROGENATED BLOCK COPOLYMERS CONTAINING A BLOCK DERIVED FROM LOW VINYL POLYBUTADIENE AND A BLOCK DERIVED FROM MEDIUM VINYL POLYBUTADIENE

Floyd E. Naylor, and Robert P. Zelinski, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 9, 1976, Ser. No. 656,770

Int. Cl.[2] C08F *293/00*

U.S. Cl. 260—879 22 Claims

1. A hydrogenated radial block polymer represented by the formula $(HL_vB—HM_vB)_aZ$ wherein each HL_vB represents a block of hydrogenated low vinyl polybutadiene, each HM_vB represents a block of hydrogenated medium vinyl polybutadiene, Z represents a residue from the coupling agent employed in the preparation of said radial block polymer, and *a* represents the degree of branching and is at least about 3, wherein prior to hydrogenation the vinyl content of said low vinyl block is in the range of about 6 to 20 weight percent, and the vinyl content of said medium vinyl block is in the range of about 20 to 90 weight percent and is substantially higher than the vinyl content of said low vinyl block.

4,107,237

RUBBER-MODIFIED ACRYLONITRILE-STYRENE-INDENE INTERPOLYMERS

George S. Li, Aurora, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

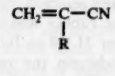
Filed Feb. 17, 1977, Ser. No. 769,509

Int. Cl.[2] C08F *279/02*

U.S. Cl. 260—880 R 8 Claims

1. The polymeric composition resulting from the polymerization of a mixture consisting essentially of 100 parts by weight of

A from about 25 to 70% by weight of at least one nitrile having the structure



wherein R is hydrogen, a lower alkyl group having from 1 to 4 carbon atoms, or a halogen,

B from about 15 to 70% by weight of styrene, and

C from about 5 to 20% by weight of indene wherein the given percentages of (A), (B) and (C) are based on the combined weights of (A), (B) and (C) in the presence of from 1 to 40 parts by weight of

D. a rubbery polymer of at least 50% by weight of a conjugated diene monomer selected from the group consisting of butadiene and isoprene and up to 50% by weight of at least one member selected from the group consisting of a styrene, acrylonitrile, and ethyl acrylate.

4,107,238

GRAFT COPOLYMERIZATION PROCESS

Robert Roper, Summit, and Arthur W. Langer, Jr., Watchung, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Jan. 22, 1976, Ser. No. 651,573

Int. Cl.[2] C08F *279/02*

U.S. Cl. 260—880 19 Claims

1. A method for grafting styrene monomer in high grafting efficiency onto an elastomeric isobutylene-conjugated diene copolymer which comprises the steps of: (a) forming a solution of the elastomer in an inert hydrocarbon solvent; (b) treating said solution with an organolithium chelating polyamine composition whereby a polymer lithium polyamine complex is formed; (c) treating said complex with from 2 to 50 volume % of an organic monoether or polyfunctional ether whereby unreacted organolithium polyamine is decomposed; and (d) contacting the styrene monomer with the treated complex of step (c) whereby a graft copolymer is formed, at least a major proportion of the reacted styrene monomer being present in said graft copolymer, and said copolymer is a thermoelastomer.

4,107,239

PHENOLIC-ACRYLIC FAST-CURING SEALANT SYSTEM

Bruce Leffingwell, Hartford, Conn., assignor to MPB Corporation, New Britain, Conn.

Division of Ser. No. 517,736, Oct. 24, 1974, Pat. No. 3,957,907. This application Nov. 25, 1975, Ser. No. 635,166

Int. Cl.[2] C08L *33/00*

U.S. Cl. 260—881 6 Claims

1. A storage-stable adhesive composition capable of curing rapidly in the presence of a free-radical catalyst, which composition contains from about 5% to 90% by weight of tris(dimethylaminomethyl)phenol tri(hydromethacrylate); from about 10% to 90% of at least one vinyl-polymerizable monomer and less than about 60% of at least one compatible acrylic polymer or copolymer.

4,107,240

METHOD AND DEVICE FOR LAKE RESTORATION BY OXYGEN-ENRICHING OF THE WATER

Bo Lennart Verner, Stockholm, and Lars Börje Staffan Fors, Ingarö, both of Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Continuation of Ser. No. 551,930, Feb. 21, 1975, Pat. No. 4,060,574, which is a continuation of Ser. No. 258,546, Jun. 1, 1972, abandoned. This application Feb. 11, 1977, Ser. No. 767,882

Claims priority, application Sweden, Jun. 1, 1971, 7002/71; Jan. 28, 1972, 972/72

Int. Cl.[2] B01F *3/04*

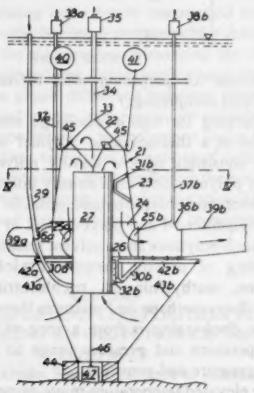
U.S. Cl. 261—77 33 Claims

1. A method of enriching the oxygen concentration in a subsurface stratum of a thermally stratified body of water comprising an upper warmer and relatively oxygen-rich epilimnion, an intermediate thermocline and a lower colder relatively oxygen-poor hypolimnion, while maintaining undisturbed the thermal stratification thereof, which method comprises:

(a) positioning a confined open-ended gas and water contact zone in the hypolimnion and extending said contact zone upwardly in the hypolimnion;

(b) passing a stream of pressurized oxygen-containing gas into the lower end of said confined open-ended gas and water contact zone to propel by gas lift pump action in the hypolimnion a column of hypolimnetic water upwardly within said contact zone while simultaneously enriching

the oxygen concentration thereof by intense contact of said hypolimnetic water with said pressurized gas;
(c) positioning an upwardly confined collection zone in the hypolimnion above said contact zone and surrounding said contact zone to form an annular outlet zone terminating a predetermined distance below the top of and above said lower end of said contact zone;
(d) entrapping excess propellant in said collection zone to form a gas cushion in said collection zone;
(e) maintaining said contact zone and collection zone buoyant in the hypolimnion by means of at least said gas cushion;
(f) utilizing said gas cushion to cause oxygenated hypolimnetic water from said column and said collection zone to flow downwardly within said annular outlet zone;
(g) introducing the thus oxygen-enriched hypolimnetic water into the hypolimnion of the body of water from the outlet zone;
(h) venting entrapped undissolved gas from said collection zone to the atmosphere at a controlled rate to maintain said gas cushion at a predetermined pressure and volume effective to produce undisturbed downward flow of the oxygen-enriched hypolimnetic water within said outlet zone and inhibit flow of entrapped gas bubbles therein, said predetermined volume being at least large enough that said contact and collection zones are maintained buoyant in the hypolimnion;



(i) subjecting the oxygen-enriched hypolimnetic water to a secondary gas collection step before introducing same into the hypolimnion from the outlet zone; and
(j) mooring said contact and collection zones to the bottom of the body of water to locate said contact and collection zones a predetermined distance from the bottom of the body of water.

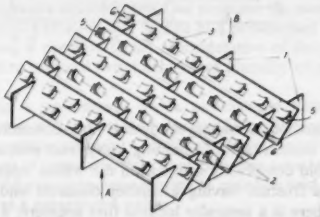
12. Apparatus for enriching the oxygen concentration in a subsurface stratum of a thermally stratified body of water having an upper warmer and relatively oxygen-rich epilimnion, an intermediate thermocline and a lower colder relatively oxygen-poor hypolimnion, while maintaining undisturbed the thermal stratification thereof, which apparatus comprises:
(a) an upwardly extending open ended shell located in the hypolimnion, said shell having upper and lower ends;
(b) nozzle means for introducing pressurized oxygen-containing propellant gas into the lower end of said shell to propel by gas lift pump action in the hypolimnion a column of hypolimnetic water upwardly within said shell to thereby increase the oxygen concentration thereof;
(c) collection means located in the hypolimnion above said shell for entrapping excess propellant to form a gas cushion within said collection means;
(d) said collection means extending downwardly around said shell to form an outlet passage surrounding said shell, said collection means terminating a predetermined distance below said upper end and above said lower end of said shell for passing oxygen-enriched hypolimnetic water downwardly through said outlet passage from said gas cushion;
(e) outlet means coupled to said outlet passage and located at a level below said upper end and above said lower end of said shell for reintroducing the downwardly flowing oxygen-enriched hypolimnetic water into the hypolimnion;
(f) venting means coupled to said collection means and in communication with said gas cushion for venting excess undissolved gas produced by said gas lift pump action to the atmosphere to maintain said gas cushion at a predetermined pressure and volume to maintain said shell and collection means buoyant in the hypolimnion under the influence of at least said gas cushion, and to produce substantially undisturbed downward flow of the oxygen-enriched hypolimnetic water within said outlet passage and then through outlet means into the hypolimnion; and
(g) mooring means coupled to at least one of said shell and collection means for mooring said shell and collection means to the bottom of the body of water to maintain said shell and collection means buoyantly located a predetermined distance above the bottom of the body of the water.

4,107,241

CONTACTING ARRANGEMENT FOR MASS TRANSFER OPERATIONS

Roland Braun, Ludwigshafen am Rhein, Fed. Rep. of Germany, assignor to Raschig G.m.b.H., Ludwigshafen am Rhein, Fed. Rep. of Germany

Filed Oct. 12, 1976, Ser. No. 731,623
Int. Cl.[2] B01F *3/04*
U.S. Cl. 261—79 A **6 Claims**



1. A contacting arrangement for mass transfer operations, which comprises
a plurality of stacked contacting grates, each of which comprises a set of laterally spaced apart, parallel first strips which are transverse to vapor and liquid flow passage, the vapor being countercurrent to the liquid flow, and a set of laterally spaced apart second strips, each of which has a longitudinal direction which is transverse to the longitudinal direction of said first strips of the same grate,
each of said second strips having at right angles to its longitudinal direction a direction which includes an oblique angle with the longitudinal direction of said first strips of the same grate,
said oblique angle being in the same sense for all said second strips of a grate and being in opposite senses for the second strips of adjacent grates, whereby said second strips of all said grates define zig-zag flow passages,
each strip of each of said sets intersecting all strips of the other set of the same grate,
the strips of at least one of said sets, having holes and struck-out lugs adjacent of said holes, for increasing the general turbulence available for mass transfer, as well as reducing the pressure drop therein, said lugs of adjacent grates being angled from said strips of at least one set in opposite senses,

said second strips repeatedly deflecting the vapor rising between said second strips, and said second strips being wetted by the liquid flowing countercurrent to the vapor and in contact therewith,

each of said first strips is formed with slots which are spaced apart in the longitudinal direction of said strip, and include an oblique angle with its longitudinal direction and said second strips extending through said slots.

4,107,242

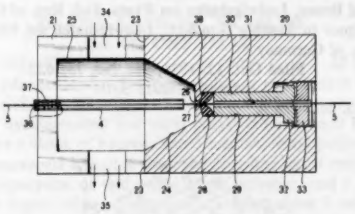
METHOD OF FABRICATING OPTICAL FIBER CONNECTORS

Peter Klaus Runge, Fair Haven, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 630,930, Nov. 11, 1975. This application Apr. 21, 1977, Ser. No. 789,549

Int. Cl.[2] B29D *11/00*

U.S. Cl. 264—1 **3 Claims**



1. A method of making an optical fiber connector having a flexible, dome-shaped contacting body; said method employing a mold comprising a precision die whose interior surface defines a frustum having a smaller diameter end surface in which there is a centrally located first aperture; a pair of detachable blocks having interior surfaces defining the body portion of said connector and including end surface portions wherein a second aperture is centrally located; said die and said blocks being mated to form one continuous mold cavity having the shape of the connector to be made; and an annulus disposed outside said mold cavity and coaxially aligned with, and adjacent to said first aperture;

said method characterized by the steps of:

securing an optical fiber within a protecting sleeve;

inserting said sleeve and secured fiber into said mold cavity through said second aperture with the fiber extending through said first aperture;

heating said mold to the transfer molding temperature;

injecting a transfer molding compound into said mold so as to fill the cavity defined by said mold;

the material of the annulus being such that it expands inward radially at the transfer mold temperature, simultaneously sealing the first aperture and gripping said fiber so as to accurately center said fiber in said first aperture;

and including the further steps of:

curing said injected mold compound;

cooling said mold;

removing the resulting connector from the mold;

cutting the fiber off at the end of the connector to remove any excess;

and applying a flexible contacting dome body to the cut fiber end.

4,107,243

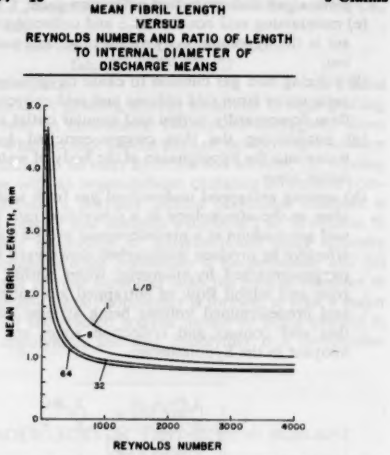
PREPARATION OF THERMOPLASTIC POLYMER FIBRILLA AND FIBRIL

Richard S. Stearns, Malvern; Neil A. Frankel, Media, both of Pa., and Elmer J. Hollstein, Wilmington, Del., assignors to Suntech, Inc., St. Davids, Pa.

Filed Jun. 10, 1976, Ser. No. 694,749

Int. Cl.[2] D01D *5/04*

U.S. Cl. 264—13 **6 Claims**



1. A process for preparing solid thermoplastic polymer fibrilla or fibril comprising:

(a) discharging through a discharge means a two phase mixture of a thermoplastic polymer selected from the group consisting of low density polyethylene, medium density polyethylene, high density polyethylene, isotactic or syndiotactic polypropylene, isotactic polystyrene poly-4-methylpentene-1 and polybutene-1 or a blend of two or more such polymers and a solvent selected from the group consisting of pentane, hexane, cyclohexane, dichloromethane, methylchloride, trichlorotrifluoroethane, trichlorofluoromethane and mixtures thereof, where

(1) the discharging is from a zone of both an elevated temperature and pressure range to a zone of lower temperature and pressure,

(2) the elevated temperature range causes the formation of the two-phase mixture and maintains the two-phase mixture prior to discharge and after discharging permits vaporization of the solvent to cool the polymer to a temperature below the freezing point of the polymer,

(3) the differences between both the elevated temperature and pressure range and both the lower temperature and pressure are effective to cause rapid evaporation of the solvent after the discharging,

(4) one phase of the mixture is a polymer-rich phase and the other phase is a solvent-rich phase and concentrations between the two phases are in general equilibrium with each other,

(5) the polymer is soluble in the solvent at a temperature above the polymer's melting point but is essentially insoluble in the solvent at a temperature below about the freezing point of the polymer;

(b) and the mixture flowing has a Reynolds, Re, of less than 2×10^3, and the means has a ratio of length of internal diameter, L/D, in the range between from about 0.5 to about 100 and that the relationship between the Re, L/D, polymer and solvent is such that according to the following equation:

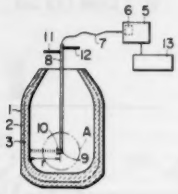
$$\text{mean fibril length} = 0.9122\,(L/D)^{-0.0498} + 489.5(Re)^{-1}\,(L/D)^{-0.2619}$$

the resulting mean fibril length is between from about 0.8 millimeters to about 2.9 millimeters.

4,107,244
METHOD AND APPARATUS FOR REPAIRING DAMAGED SURFACE OF REFRACTORY LINED VESSEL

Tsunemi Ochiai, and Teruyuki Nishitani, both of Himeji, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Jun. 14, 1976, Ser. No. 695,964
Claims priority, application Japan, Jun. 13, 1975, 50-71695
Int. Cl.[2] F27D *1/16*
U.S. Cl. 264—30 10 Claims

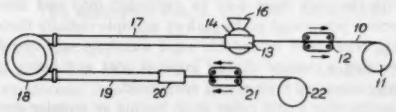


1. In a method of repairing a damaged portion of the lining of a refractory lined vessel which comprises setting a reference position in the space of a vessel whose heated refractory lining is not substantially cooled, inserting an antenna and monolithic refractory nozzle into the vessel which are directed to the lining surface, causing microwaves transmitted from the antenna to reflect with the lining surface while shifting the antenna, receiving the microwaves, measuring the distance between each position on the lining surface and the reference position from the phase difference between the transmitted waves and received waves, comparatively operating the distance and a distance between the reference lining surface and the reference position, taking out deviations of each position as electric signals, controlling the transfer of the nozzle by employing the deviation signals, gunning the monolithic refractory to the deviated portion which needs repair and repairing the refractory lining.

4,107,245
METHOD OF AND COMPOSITION FOR MANUFACTURING AN OBJECT OF CROSS-LINKED POLYMER

Gunnar Jansson, Älvsjö, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Sep. 4, 1975, Ser. No. 610,435
Claims priority, application Sweden, Sep. 9, 1974, 7411327; Sep. 9, 1974, 7411328; Jun. 9, 1975, 75065318; Jun. 9, 1975, 7506532
Int. Cl.[2] C08K *5/00*
U.S. Cl. 264—40.1 32 Claims

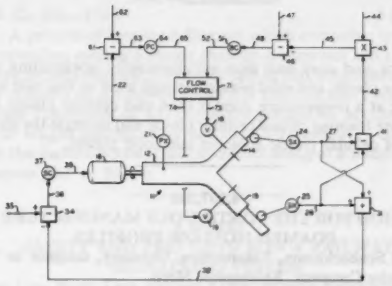


1. Method of manufacturing an object of cross-linked polymer by using a peroxide, which comprises forming a starting material containing a peroxide and a polymer material with the ability to undergo a cross-linking reaction in the presence of the peroxide into an object and cross-linking the starting material during at least part of the manufacturing process in the presence of a substance with the ability to undergo a colour change during the cross-linking reaction of the polymer material, so that a colour change of the substance is achieved wherein said substance is an aromatic compound containing at least one halogen atom and/or at least one heterocyclic ring, in which ring there is at least one nitrogen atom to which no hydrogen atom is linked.

4,107,246
EXTRUSION CONTROL

Ronald J. LaSpisa, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 20, 1976, Ser. No. 751,860
Int. Cl.[2] B29F *3/06*
U.S. Cl. 264—40.7 23 Claims



1. A method for controlling an extrusion process wherein a plurality of extrusion lines are supplied by a common source of molten extrudable material, said method comprising:

establishing an individual extrusion rate signal associated with each said extrusion line and representative of the rate of extrusion therethrough;

controlling the rate of delivery of said molten material by said common source thereof to maintain the sum of said individual extrusion rate signals at a preselected value;

establishing a pressure signal representative of the pressure of molten material provided to said plurality of extrusion lines;

generating a preliminary valve position set point signal associated with each said extrusion line, said preliminary valve position set point signals being representative of the positions of respective flow control valves associated with each said extrusion line required to maintain said pressure signal at a preselected value;

establishing, in response to a comparison of two or more of said individual extrusion rate signals, a valve position set point adjustment signal associated with each said extrusion line, each said valve position set point adjustment signal being representative of the change in the position of the flow control valve associated therewith necessary to provide a preselected relationship among the individual extrusion rate signals;

combining the preliminary valve position set point signal and the valve position set point adjustment signal associated with each said extrusion line to produce a plurality of adjusted valve postion set point signals; and

positioning the valve associated with each said extrusion line to provide a valve position represented by its respective adjusted valve position set point signal.

4,107,247
METHOD OF CO-EXTRUSION WITH FOAM CORE

Joseph Dukess, 517 Fayette Ave., Mamaroneck, N.Y. 10543

Continuation-in-part of Ser. No. 482,433, Jun. 24, 1974, abandoned. This application Mar. 26, 1976, Ser. No. 670,623
Int. Cl.[2] B29D *27/00*
U.S. Cl. 264—45.9 5 Claims

1. A method of manufacturing a coextruded article comprising the steps of mixing ingredients for a cellular plastic including a chemical blowing agent and a thermoplastic resin in a plastic state for forming a core and at a temperature ranging

between 300° and 400° F. and with no cross linking agent, mixing other ingredients for at least one solid thermoplastic resin in a plastic state at a temperature differing from and hotter than said temperature by at least 25° F., for forming a

skin for said core and then simultaneously coextruding said cellular plastic and solid plastic through a die so that said solid plastic at a temperature greater then said cellular plastic will promote foaming of said cellular plastic and increase the size of cells of cellular plastic adjacent said solid plastic.

4,107,248

METHOD FOR THE CONTINUOUS MANUFACTURE OF FOAMED HOLLOW PROFILES

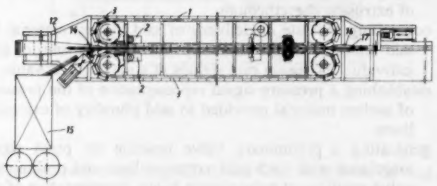
Alfred Schlieckmann, Vaterstetten, Germany, assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 615,248, Sep. 22, 1975, Pat. No. 4,021,173. This application Nov. 15, 1976, Ser. No. 741,858

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1974, 2449044

Int. Cl.² B29C *5/10*; B29D *23/00, 27/04*

U.S. Cl. 264—51 **3 Claims**



1. The method of continuously manufacturing a foam pipe or annulus having a diametrically oriented slit extending longitudinally along its wall to give lateral access to an open center of substantially greater cross section than the width of the slit, which method comprises providing an articulated segmented internal core of suitable cross section to form said open center of said foam pipe, and a paired series of complementary outer mould portions externally and spacedly surrounding said core to define the annulus, said complementary mould portions having a parting plane along which they are separable and being formed in said plane to define a gap coincident with said diametrically oriented slit of said foam pipe, displacing said paired series in movement-conforming manner along a predetermined rectilinear path of travel while maintaining the respective outer mould portions in closed complementary relation whereby to form a moving moulding channel having said diametrically oriented gap extending lontigudinally in said parting planes coextensive with said predetermined path, providing a support externally of said mould portions, and supporting said core segments within said channel from said support by bridge elements which extend into said diametrically oriented gap and substantially close same and dispose said segmented core substantially axially of said moulding channel, advancing said core support means along said predetermined path in movement-conforming manner concomitantly with said outer mould portions to produce a continuous moving moulding channel of open-ended annular configuration and to avoid substantial relative motion between said internal core and outer mould portions, advancing a carrier sheet continuously into said moulding channel inlet and depositing a self-rising foam mix on said sheet ahead of said inlet, folding the lateral edges of said carrier sheet upwardly to conform it generally with the outer annular moulding surface with said edges extending outwardly through said diametrically oriented longitudinal gap on opposite sides of said core-supporting bridge elements to fully close said gap, and allowing said foam mix to rise and fill said moulding channel and encase said concomitantly advancing core means during advance along said predetermined path.

4,107,249

METHOD FOR FORMING AN ANNULAR GROOVE IN A THERMOPLASTIC PIPE

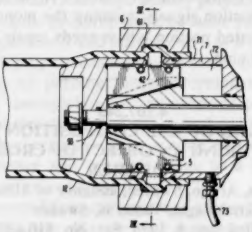
Sadao Murai; Nobuo Goto, both of Hirakata; Katsuhiko Tanioka, Asaka; Masaaki Matsunaga, Otsu, and Riyoiti Isayama, Asaka, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 12, 1976, Ser. No. 666,372

Claims priority, application Japan, Mar. 12, 1975, 50-30340; Mar. 12, 1975, 50-30341

Int. Cl.² B29C *17/02*

U.S. Cl. 264—68 **3 Claims**



1. A method of forming an annular groove in a thermoplastic pipe comprising,

(a) fitting said pipe and a core mold having first and second segments with an aperture therebetween relative to one another so that an end of said pipe fits over said core mold with the part thereof to be expanded into said annular groove positioned in the path of multiple radially through said core mold extendable rigid members said members abutting a conical shaped internal core and being presently retracted within said core mold,

(b) positioning a split outer mold having an annular groove therein around said pipe so that the said annular groove of said outer mold confronts the outer periphery of the said part of said pipe to be expanded into said annular groove,

(c) applying an increased fluid pressure to the internal side of said part,

(d) sliding said conical shaped internal core, thereby extending said rigid members radially through said core mold to abut and expand said part, said applying step being continuous substantially for the duration of said extending step,

(e) hardening said pipe after expansion of said part,

(f) retracting said rigid members within said core mold, and

(g) removing said pipe and said core mold from one another.

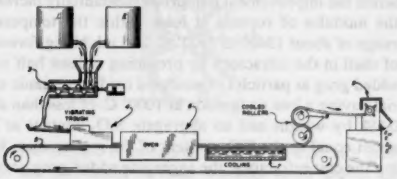
4,107,250
PROCESS FOR MAKING FIBER-REINFORCED THERMOPLASTIC PELLETS

James Zechinati, Woodridge, and Elra W. Pegg, Aurora, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 522,046, Nov. 8, 1974, abandoned, which is a continuation of Ser. No. 277,996, Aug. 4, 1972, abandoned. This application Feb. 24, 1977, Ser. No. 771,433

Int. Cl.² B01J *2/26*

U.S. Cl. 264—118 **6 Claims**



1. A process comprising:

(a) forming a uniform mixture of fibers and powdered thermoplastic material of mesh size small enough to assure uniformity and continuously depositing said mixture on a moving conveyor belt in the form of a uniform-in-thickness-and-width layer, said mixing and depositing carried out so that said fibers are not degraded by breaking and are randomly oriented substantially in a plane;

(b) subjecting said layer to an elevated temperature whereby the thermoplastic material in said mixture flows freely, said temperature chosen to control the flow of said thermoplastic material in said mixture so that a desired geometry thereof is not disturbed and so as to avoid degrading of said thermoplastic material and said fibers;

(c) cooling the result of (b) to form a continuous, uniform, composite belt which can be cut without fouling cutter knives and which has a height of between about five-hundredths and about one-fifth inch containing said fibers randomized substantially in the plane of said belt; and

(d) cutting said belt into pellets, two dimensions being between one-eighths and three-eighths inch and the third dimension in the range of about **0.05** to about **0.2** inch being equal to the height of said belt.

4,107,251
PRODUCTION OF FILMS AND SHEETS OF POLYESTER-POLYCARBONATE BLENDS

Philip Stuart Bollen, Auburn, and Surendra A. Amin, both of Pottsville, Pa., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 552,496, Feb. 24, 1975, Pat. No. 3,975,355. This application Jun. 3, 1976, Ser. No. 692,696

Int. Cl.² B29C *17/04*

U.S. Cl. 264—171 **11 Claims**

1. A process of forming a film or sheet capable of being thermoformed into a shaped article, said process comprising the steps of:

(a) blending about 60 to 85 parts by weight of a polyethylene terephthalate having an intrinsic viscosity of at least about 0.90 with about 15 to 40 parts by weight of a polycarbonate polymer and about 5 to 20 parts by weight of a non-acidic silica filler having a particle size of from about 1 micron to about 100 microns;

(b) extruding the resultant blend at a temperature above about 500° F. onto a moving support while maintaining the surface of said support at a temperature of about 225° to 380° F. whereby a film or sheet of the blend is formed; and

(c) collecting said film or sheet, said film or sheet being essentially nonoriented and the polyethylene terephthalate fraction of said film or sheet having a degree of crystallinity in the range of about 20 to 40 percent.

4,107,252
MELT SPINNING SYNTHETIC FILAMENTS

Michael Hugh Richmond, Sarnia, Canada, assignor to Polysar Limited, Sarnia, Canada

Continuation-in-part of Ser. No. 573,117, Apr. 30, 1975, abandoned. This application Sep. 8, 1976, Ser. No. 721,232 Claims priority, application Canada, May 22, 1974, 200529

Int. Cl.² D01D *1/04*

U.S. Cl. 264—176 F **5 Claims**

1. A process of forming a filament which comprises spinning by extruding molten polymer through a spinneret and cooling the so formed filament, characterized in that the molten polymer contains no solvent or plasticizer and that said polymer is a solid copolymer of 65–75 weight percent of acrylonitrile, 12–18 weight percent of styrene and 13–18 weight of isobutylene, the molten polymer and spinneret being at a temperature of about 350° to 500° F.

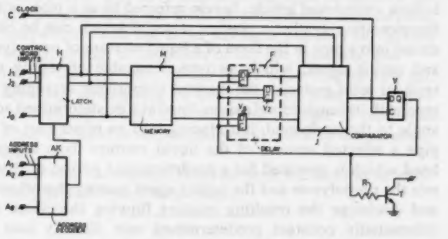
4,107,253
SAFETY AND TEST DEVICE IN A RAILWAY SIGNALLING SYSTEM

Lars Uno Borg; Lars Ragnar Kamp, both of Stockholm, and Kjell Olow Ingemar Olsson, Järfälla, all of Sweden, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 1, 1976, Ser. No. 746,332

Int. Cl.² B61L *3/24*

U.S. Cl. 246—182 B **6 Claims**



1. In a safety and test device in a railway signalling system comprising computer means having output means and input means for receiving information signals relating to prevailing and desired operating conditions such as prevailing speed, prevailing brake line pressure and desired speed, said computer means being adapted to treat said information signals in accordance with a predetermined program and to produce output signals for application to activation means comprising a brake for braking a train in order to effect speed reduction determined to be necessary by the treatment of said information signals, the improvement wherein the computer means is adapted in a cyclically repeated sequence to run through test program sections and at the end of each such program section to generate a control word, and comprising a control unit adapted to receive said control words successively generated by the computer means, said control unit being connected between the computer means and the activation means and including a memory for storing predetermined control words in a given sequence, a comparator for comparing the control words received from the computer means with said predetermined control words stored in said memory, means for producing an output pulse each time a received control word coincides with a control word stored in said memory and is received in said given sequence, and means for feeding said pulses from said control unit to a magnetic winding which keeps the brake in an unactivated condition, said computer means being further adapted to generate a further control word which is included in the given sequence of control

words, said further control word being generated at the end of said predetermined program if the treatment of said information signals indicated that braking is not to be effected, while if the treatment of the said information signals indicates that braking is to be effected said further control word is not generated or an erroneous control word is generated so that braking will be effected via said control unit due to disappearance of said output pulses.

4,107,254

METHOD OF LINING PIPES, MOLDS OR OTHER TUBULAR ARTICLES WITH THERMOSETTING PLASTIC MATERIAL

John David Webster, and Thomas John Jewell, both of St. Austell, England, assignors to English Clay Lovering Pochin & Co. Ltd., England

Continuation of Ser. No. 395,065 Sep. 7, 1973, abandoned. Filed Oct. 16, 1975, Ser. No. 623,060

Claims priority, application United Kingdom, Sep. 14, 1972, 42785/72

Int. Cl.[2] B29D *9/00*; B29G *7/00*

U.S. Cl. 264—270 **11 Claims**

1. A method of lining a pipe, mould or other tubular or hollow cylindrical article, herein referred to as a pipe, with a thermosetting synthetic plastics material which can be introduced into a pipe in the form of a liquid mixture of prepolymer and curing agent, which mixture is capable of setting to a resilient solid material, the method comprising arranging the pipe with its longitudinal axis inclined at a predetermined acute angle to the horizontal, introducing into an upper part of the pipe a selected amount of the liquid mixture from a mixing head which is operated for a predetermined period of time to mix the prepolymer and the curing agent passing therethrough and discharge the resulting mixture flowing therefrom at a substantially constant predetermined rate directly into the pipe, the pipe being held stationary while the liquid material is introduced, the angle of inclination of the pipe and the rate of introduction of the liquid mixture being so arranged that the liquid mixture which is first introduced into the pipe flows along the inside wall of the pipe to a predetermined lower part of the pipe in the same time as that for completing the introduction of the selected amount of liquid mixture, whereby the material is distributed along a length of the pipe, thereafter shifting the pipe to a position in which its longitudinal axis is horizontal and then spinning the pipe about its longitudinal axis to distribute the liquid mixture around the inside of the wall of the pipe, spinning being continued until the plastics material has set.

4,107,255

MANUFACTURE OF IMPROVED FUSED CAST REFRACTORY

Thomas A. Clishem, Louisville, Ky.; Frederick D. Olympia, Elmira, N.Y., and Leonard W. Pokallus, Louisville, Ky., assignors to Corning Glass Works, Corning, N.Y.

Continuation-in-part of Ser. No. 558,301, Mar. 14, 1975, abandoned. This application Aug. 1, 1977, Ser. No. 820,534

Int. Cl.[2] C04B *35/60*

U.S. Cl. 264—299 **13 Claims**

1. The process of manufacturing basic fused cast refractory having principal crystal phases of periclase and magnesium-spinel and analytically consisting essentially of (by weight) of 45–78% MgO, 0–30% Cr_2O_3, 0–35% Al_2O_3, 0–17% FeO + Fe_2O_3, at least 82% MgO + Cr_2O_3 + Al_2O_3 + FeO + Fe_2O_3, 1–8% SiO_2, 0–2% CaO + BaO + SrO, 0–10% TiO_2 and 0–3% fluorine,

which comprises forming a molten mass of the refractory, pouring a stream of the molten mass into a mold cavity and thereby filling the cavity with the molten mass cast there-into, adding particles of grog to the molten mass before, during and/or after pouring of it into the mold cavity, and at least partially solidifying the cast molten mass in the mold cavity to a state of self-sustaining cast shape substantially complementary to the interior surface configuration of the mold cavity,

wherein the improvement comprises substantially increasing the modulus of rupture at least within the temperature range of about 1340° to 1500° C. and inhibiting formation of shell in the refractory by providing at least half of the added grog as particles of nonfused oxidic inorganic material having a loss on ignition at 1000° C. of less than about 0.5% by weight and an aggregate SiO_2 content at least about equal to the SiO_2 content of the molten mass forming the cast refractory, the aggregate added grog particles being of a size and in an amount to about 70% by weight of the cast refractory sufficient to effect at least partial melting of and penetration into the particles by and resolidification with the cast molten mass so as to form a continuous coherent crystal structure throughout the solidified cast mass wherein discrete grog particles and remnants thereof are not optically identifiable, and at least that portion (if any) of the grog in excess of about 35% by weight of the cast refractory being SiO_2.

4,107,256

SUSPENSION POLYMERIZATION OF POLYURETHANES AND SPIN-MOLDING THE POWDER PRODUCT THEREOF

Wendell R. Conrad, Kent; Shingo Futamura, Seville, and Robert A. Hayes, Cuyahoga Falls, all of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Apr. 18, 1977, Ser. No. 788,214

Int. Cl.[2] B29C *5/04*; C08G *18/82, 18/83, 18/86*

U.S. Cl. 264—310 **39 Claims**

1. A suspension polymerization process for producing polymerized suspended polyurethanes, comprising the steps of:

adding a silicone surfactant to a nonaqueous suspending medium,

said suspending medium being a nonsolvent with respect to polymerized urethanes,

adding urethane prepolymers to the resulting nonaqueous suspending medium,

agitating said nonaqueous suspending medium containing said silicone surfactant and said urethane prepolymers, and

polymerizing said urethane prepolymers by adding a chain extending agent to said suspending medium containing said urethane prepolymers to produce fine discrete particles of urethane polymers.

31. A process for curing suspension polyurethane powders during spin molding, comprising the steps of:

spinning and heating a mold having therein a fusible suspension powdered compound selected from the class consisting of a polyurethane, a urethane-urea polymer, and combinations thereof, having a plasticity of at least 2,000 square millimeters at 150° C, and a curing agent,

said heating temperature ranging from about 130° C to a temperature below the decomposition temperature of said suspension powder to produce a cured article.

4,107,257
METHOD FOR MOLDING DYNAMICALLY BALANCED FANS

Richard E. Swin, Sr., 5302 Howard, Western Springs, Ill. 60558
Division of Ser. No. 616,387, Sep. 24, 1975, Pat. No. 4,047,692.
This application Apr. 22, 1977, Ser. No. 789,872
Int. Cl.[2] B29C 5/00; B29F 1/00
U.S. Cl. 264—328 2 Claims

1. In the method of injection molding dynamically balanced plastic air movement devices wherein mold halves having complementary faces forming a mold cavity in the configuration of an air movement device are injected with plastic material to form an air movement device in the configuration of the mold cavity, the improvement comprising

inserting a plurality of selectively extendable plugs into one of the mold halves to form balancing pads of plastic material on the air movement device at predetermined positions to effect dynamic balancing thereof, and

adjusting said selectively extendable plugs from the face of said mold half to vary the quantity of plastic material forming said balancing pads.

4,107,258
INJECTION MOLDING REDUCED COMBUSTIBILITY HIGH IMPACT STRENGTH POLYETHYLENE ARTICLES

Richard Gordon Angell, Jr.; Laurence Herbert Gross, both of Bridgewater, N.J., and Sidney Ethan Berger, Rye, N.Y., assignors to Union Carbide Corporation, New York, N.Y.
Filed Nov. 10, 1977, Ser. No. 850,353
Int. Cl.[2] C08K 5/54
U.S. Cl. 264—328 8 Claims

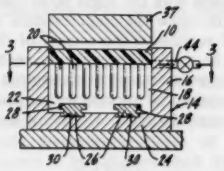
1. The process for the production of injection molded high density polyethylene articles having reduced combustibility and high impact strength comprising: maintaining a mold cavity at a preselected back pressure sufficiently high to substantially prevent foaming of a high density polyethylene material melt to be injected therein; injecting said melt into said mold cavity under pressure in excess of said back pressure to fill said mold cavity; said high density polyethylene material melt containing; (a) from about 50 to 70% by weight of alumina trihydrate, (b) from about 1 to 12% by weight of water as a processing aid, and (c) from about 0.5 to 3% by weight of a methoxy polyethylene glycol propyltrimethoxy silane having the formula:

$$CH_3O(C_2H_4O)_n C_3H_6 Si(OCH_3)_3,$$

wherein n represents the average number of ethoxy repeat units between about 3.0 and 11.0.

4,107,259
METHOD OF MAKING A CROSS LINKED PILE PRODUCT

William Chang Liu, Northbrook, Ill.; Francis H. Bratton, deceased, late of Wilmette, Ill. (by Jean C. Bratton, executrix), and Robert Ronald Nali, Mundelein, Ill., assignors to Brunswick Corporation, Skokie, Ill.
Division of Ser. No. 531,183, Dec. 9, 1974. This application Oct. 15, 1976, Ser. No. 732,935
Int. Cl.[2] B29C 5/00, 7/00; B29G 7/00
U.S. Cl. 264—331 8 Claims



1. A method of compression molding a pile product whose fibers have an aspect ratio greater than 10 comprising the steps of:

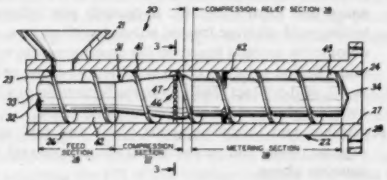
(a) subjecting a molding composition including a crosslinkable polymeric material to an elevated temperature and pressure to force the molding composition into a mold kept at the elevated temperature, the molding composition and crosslinkable material being selected so that the after crosslinking of the crosslinkable material the molding composition will have sufficient strength to remove the pile product from the mold at substantially said elevated temperature and the mold having a plurality of cavities corresponding to the fibers of the pile products; and

(b) with the formation of the fibers according to step (a), initiating crosslinking of the polymeric material to give the molding composition sufficient strength to remove it from the mold at substantially said elevated temperature; and

(c) removing the molded material from the mold at substantially said elevated temperature.

4,107,260
METHODS OF WORKING EXPANDABLE THERMOPLASTIC MATERIALS IN AN EXTRUDER

Timothy Stephen Dougherty, Roswell, Ga., assignor to Western Electric Company, Inc., New York, N.Y.
Continuation of Ser. No. 557,728, Mar. 12, 1975, abandoned.
This application Dec. 14, 1976, Ser. No. 750,471
Int. Cl.[2] B29B 1/06
U.S. Cl. 264—349 9 Claims



1. A method of extruding expandable thermoplastic materials, which comprises the steps of:

moving a core having a helical flight formed thereon rotatively about an axis of rotation to advance an expandable thermoplastic material along a path in a downstream direction from a supply end to an output end while compressing and heating portions of successive increments of the expandable thermoplastic material along a portion of

the path which decreases continuously in cross-sectional area in the downstream direction to progressively melt the thermoplastic material and while causing unmelted portions of the expandable thermoplastic material to fragment at a predetermined location along said portion of the path; while

subjecting the thermoplastic material to forces exerted by force-producing components, which are attached to the core in the path of the thermoplastic material at the location at which the unmelted portions of the thermoplastic material fragment with at least some portion of each of the components lying in a plane which is perpendicular to the axis of rotation with the flight being continuous through the plane, to cause the fragmentation of the unmelted portions of successive increments of the thermoplastic material to be continuous and to be such as to provide a constant temperature melt at the output end with corresponding portions of successive increments of the melt having substantially identical thermal histories.

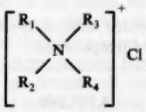
4,107,261
PROCESS FOR THE SEPARATION OF PLATINUM GROUP METALS

John Baltz, Lakewood, and Enzo Coltrinari, Arvada, both of Colo., assignors to PGP Industries Inc., Santa Fe Springs, Calif.

Continuation of Ser. No. 629,879, Nov. 7, 1975, Pat. No. 4,012,481. This application Dec. 15, 1976, Ser. No. 750,738
The portion of the term of this patent subsequent to Mar. 15, 1994, has been disclaimed.
Int. Cl.[2] C01G *55/00*
U.S. Cl. 423—22 **6 Claims**

1. A continuous process for the separation and recovery of Rhodium and Iridium dissolved in aqueous chloride solutions which comprises:

contacting said aqueous chloride solution with an organic solvent containing an organically substituted quaternary ammonium halide having the following structure:



wherein R_1, R_2, R_3 and R_4 are hydrocarbon groups for a predetermined time period to form an organic extract phase and an aqueous raffinate phase,

said quaternary ammonium compound being sufficiently soluble in said solvent to make a 1% solution,

separating said extract phase from said aqueous phase,

contacting said separated extract phase with at least the stoichiometric amount of aqueous sodium hydroxide solution required to neutralize the chloride form of said amine and form a metallic hydroxide precipitate, contacting said alkaline treated solvent with at least a stoichiometric amount based on the stoichiometric value of said alkaline solution of an acidified aqueous reducing agent, said contact resulting in the formation of a loaded aqueous phase and a stripped organic phase,

separating said loaded aqueous phase and said stripped organic phase, and recovering Iridium from said loaded aqueous phase,

maintaining said Rhodium in the form of a cationic complex and maintaining said Iridium in an anionic state throughout said extraction procedure.

2. A process for the separation and selective recovery of Rhodium, Ruthenium and Iridium values from an aqueous acidic medium which comprises contacting the medium with an organic extraction reagent comprising a water immiscible solvent having dissolved therein an organically substituted quaternary ammonium compound having the structure

wherein R_1, R_2, R_3 and R_4 are hydrocarbon groups, said compound being sufficiently soluble in said solvent to make a 1% solution and capable of forming complexes with Iridium and Ruthenium that are preferentially soluble in said solvent and whereby said contacting results in the formation of an organic extract phase and an aqueous raffinate phase,

separating said extract phase from said aqueous raffinate phase,

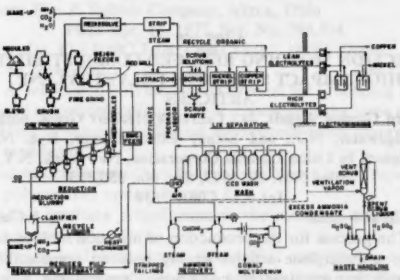
contacting said organic extract phase with a sufficient quantity of an aqueous alkaline stripping agent to neutralize the organic extract phase, said contact resulting in the formation of an aqueous phase loaded with said Iridium and Ruthenium and a stripped organic phase, and thereafter

contacting said stripped organic phase and said loaded aqueous phase with a solution consisting of an acidified reducing agent which is at least the stoichiometric equivalent of said alkaline agent, and maintaining said Rhodium in the form of a cationic complex and said Iridium and Ruthenium in their anionic states during said extraction procedure.

4,107,262
CUPRION PROCESS START-UP CONTROL

Robert E. Lueders, Needham; Roger N. Kust, Acton, and David S. Davies, Andover, all of Mass., assignors to Kennecott Copper Corporation, New York, N.Y.

Filed Aug. 26, 1974, Ser. No. 500,494
Int. Cl.[2] C01G *3/14, 51/12, 53/12*
U.S. Cl. 423—32 **9 Claims**



1. In a process in which metal values selected from the group of copper, nickel, cobalt and molybdenum are recovered from manganese nodules by introducing the nodules into a reaction vessel containing an aqueous ammoniacal-ammonium carbonate solution and cuprous ions to allow the cuprous ions to reduce the manganese oxides in the nodules to enable the metal values to be solubilized and in which cuprous ions are continuously regenerated by a reducing gas wherein the improvement comprises providing a start-up solution of cuprous ions by oxidizing copper metal with the manganese nodules from which the metal values are to be recovered and recovering metal values selected from the group of copper, nickel, cobalt and molybdenum from the manganese nodules used to oxidize the copper metal to provide the start-up solution of cuprous ions.

4,107,263

PROCESS FOR THE PREPARATION OF BROMINE AND HYDROGEN BROMIDE FROM AMMONIUM BROMIDE

Lothar Schulz, Bad Soden am Taunus, and Hans-Jürgen Arpe, Fischbach, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Division of Ser. No. 544,915, Jan. 28, 1975. This application Jun. 15, 1977, Ser. No. 806,938

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1974, 2404335

Int. Cl.² C01B 7/12, 21/02, 7/10

U.S. Cl. 423—481 **22 Claims**

1. A process for the selective production of hydrogen bromide directly from ammonium bromide which consists essentially of contacting ammonium bromide and an oxygen containing gas, at a molar ratio of oxygen to bromide of less than 1, with an inorganic oxidation catalyst containing at least one element selected from the group consisting of rhenium, a noble metal of the 8th Subgroup of the Periodic Table and carbon, and mixtures thereof, reacting said ammonium bromide and oxygen in the presence of said catalyst at about ambient pressure and a temperature of from 200 to 800° C. and a reaction time of more than 0.1 second to produce a reaction gas product consisting predominantly of hydrogen bromide, nitrogen and H_2O and recovering hydrogen bromide from said reaction gas product.

4,107,264

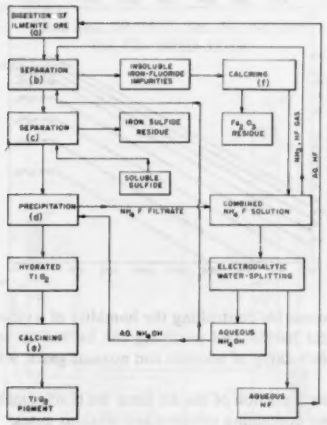
RECOVERY OF TiO_2 FROM ILMENITE-TYPE ORE BY A MEMBRANE BASED ELECTRODIALYSIS PROCESS

Krishnamurthy Nagasubramanian, Parsippany, and Kang-Jen Liu, Bridgewater, both of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Nov. 14, 1977, Ser. No. 851,221

Int. Cl.² C01G 23/04

U.S. Cl. 423—81 **5 Claims**



1. In a process for producing titanium dioxide from ilmenite-type ore including the steps of

(a) digesting ilmenite ore with aqueous hydrogen fluoride to form a solution of titanium fluoride compounds and soluble iron fluoride impurities;

(b) adding aqueous ammonium fluoride and ammonium hydroxide to substantially precipitate iron-ammonium fluoride impurities from the solution;

(c) separating the remainder of the iron fluoride impurities by precipitating with ammonium sulfide and filtering off;

(d) adding ammonium hydroxide to precipitate hydrated titanium dioxide and to form aqueous ammonium fluoride;

(e) calcining the hydrated titanium dioxide to form pigmentary titanium dioxide; and

(f) converting the precipitated iron-ammonium fluoride impurities from step (b) to form iron oxide and aqueous ammonium fluoride, the improvement which comprises subjecting the combined ammonium fluoride solutions from steps (d) and (f) to electrodialytic water-splitting to form an aqueous solution of ammonium hydroxide and an aqueous solution of hydrogen fluoride and recycling said aqueous ammonium hydroxide to step (d), and said aqueous hydrogen fluoride to step (a).

5. The improvement in accordance with claim 1 wherein the aqueous hydrofluoric acid solution produced by electrodialytic water-splitting contains ammonium fluoride.

4,107,265

TREATING RESIDUES FROM THE LEACHING OF ROASTED ZINC BLENDE

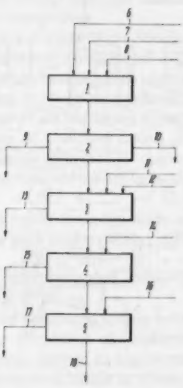
Adolf von Röpenack; Volker Wiegand, both of Datteln, and Gunter Smykalla, Gelsenkirchen-Buer, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 25, 1977, Ser. No. 800,602

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1976, 2624658

Int. Cl.² C01G 9/06

U.S. Cl. 423—101 **6 Claims**



1. A process for treating a residue from the sulfuric acid leaching of roasted zinc blende, comprising

(a) leaching the residue in a single stage with a solution containing about 120 to 250 g/l of sulfuric acid and a metal sulfide supplied in a quantity sufficient for transforming the iron in the residue into divalent iron with concurrent formation of elemental sulfur, the temperature being maintained between about 60° C and the boiling point, the resulting suspension having a sulfuric acid concentration of about 15 to 60 g/l,

(b) heating the suspension to a temperature above the melting point of sulfur, separating a first fine-grained residue of low zinc and iron contents and high lead content, and separating a coarse-grained residue containing sulfur, compounds of iron and any excess metal sulfide from (a),

(c) adjusting the pH of the residual solution to at most about 2, and at a temperature between about 80° C and the boiling point adding zinc dust thereby to precipitate copper and separating the precipitate,

(d) adjusting the pH to about 4 to 5 and separating any precipitate which forms, and

(e) oxidizing the residual solution to precipitate iron as hematite, and separating the hematite from the purified zinc-containing solution.

4,107,266
PRODUCTION OF PURE ALUMINA FROM IRON CONTAMINATED SULFATE LIQUORS

Donald J. Bauer, Reno, and Judith A. Eisele, Verdi, both of Nev., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

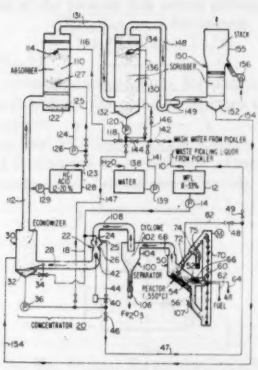
Filed Jul. 22, 1977, Ser. No. 818,045
Int. Cl.[2] C01F *7/00, 7/30*
U.S. Cl. 423—112 **5 Claims**

1. A process for recovery of alumina from iron contaminated aluminum sulfate leach liquors comprising (1) treating the liquor with hydrogen chloride to the point of incipient crystallization of aluminum chloride hexahydrate whereby the iron contaminant is converted to an anionic complex, $FeCl_4^-$, (2) extracting the resulting solution with an extractant comprising a tertiary amine to yield a raffinate of low iron content, (3) treating the raffinate with hydrogen chloride to crystallize and precipitate aluminum chloride hexahydrate, and (4) roasting the aluminum chloride hexahydrate to alumina.

4,107,267
PROCESS FOR TREATING WASTE HYDROCHLORIC ACID

Lars J. Hansen, Petersburg, Mich., assignor to Toledo Pickling & Steel Service, Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 702,082, Jul. 2, 1976, abandoned. This application Jul. 8, 1977, Ser. No. 813,817
Int. Cl.[2] C01G *49/02, 49/10*; C01B *7/01*
U.S. Cl. 423—138 **8 Claims**



1. A process for regenerating waste hydrochloric acid containing ferrous chloride and producing iron oxide comprising the steps of:

(A) concentrating said acid,

(B) reacting said concentrated acid with water and oxygen in the presence of solid particles and a hydrocarbon combustion fluid in a reactor having a bottom with opposite sides and a center portion at a resulting temperature between about 175° and 550° C. to produce hydrogen chloride and iron oxide particles without producing caking of said particles by increasing the rate of flow of said particles through said reactor more along the edges of the reactor bottom than in the center portion thereof,

(C) separating said iron oxide particles from both said hydrogen chloride and the resulting combustion gases from said hydrocarbon fluid,

(D) cooling the separated hydrogen chloride and combustion gases,

(E) absorbing in water said hydrogen chloride from said combustion gases to produce regenerated hydrochloric acid, and

(F) scrubbing the resulting combustion gases to remove harmful impurities therein before releasing said gases into the atmosphere.

8. A process for treating waste hydrochloric acid containing ferrous chloride to produce iron chloride comprising the steps of:

(A) concentrating said acid;

(B) reacting said concentrated acid in the presence of solid particles and a hydrocarbon combustion fluid in a reactor having a bottom with opposite sides and a center portion at a temperature between about 100° and 200° C. to produce iron chloride particles without producing caking of said particles by increasing the rate of flow of said particles through said reactor more along the edges in the reactor bottom than in the center portion thereof,

(C) separating said iron chloride particles from the resulting combustion gases from said hydrocarbon fluid,

(D) cooling the separated combustion gases,

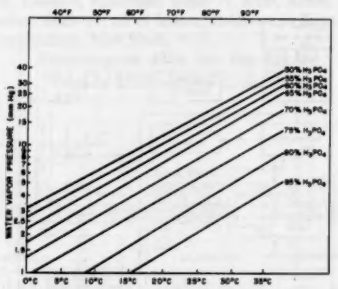
(E) treating the resulting cooled gases with water to absorb soluble gases therein, and

(F) scrubbing the resulting combustion gases to remove harmful impurities therein before releasing said gases into the atmosphere.

4,107,268
ANIMAL CONFINEMENT ENVIRONMENT CONTROL

Eugene T. O'Neill, Hightstown, N.J., and Donald O. Flach, Mamaroneck, N.Y., assignors to FMC Corporation, Philadelphia, Pa.

Filed Jul. 9, 1976, Ser. No. 703,915
Int. Cl.[2] B01D *53/34*
U.S. Cl. 423—210 **6 Claims**



1. A process for controlling the humidity of a closed animal confinement habitat and purifying the habitat air to prevent undesirable buildup of odorous and noxious gases, which comprises:

removing a portion of the air from the confinement habitat, said air containing odorous and noxious gases;

contacting the removed air with an aqueous solution containing 0.01% to 1.0% by weight hydrogen peroxide and 10% to 85% by weight of a mineral acid selected from the group consisting of phosphoric acid and sulfuric acid, said air and aqueous solution having essentially the same temperature;

absorbing and oxidizing the odorous and noxious gases in said aqueous solution;

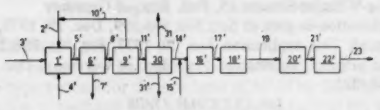
adjusting the mineral acid concentration during the contacting step to maintain the humidity level of the contacted air to the desired level between 40% and 95% relative humidity; and

passing the air back into the confinement habitat.

4,107,269
METHOD OF PURIFYING A HYDROGENATED GAS CONTAINING ACID GASES

Jean Rossarie, 117, rue Louis Brindeau, 76600 Le Havre, and Jean Maurin, rue du Temple, 76 Montivilliers, both of France

Filed Jul. 7, 1977, Ser. No. 813,771
Claims priority, application France, Jul. 12, 1976, 76 21355
Int. Cl.[2] B01D *53/34*
U.S. Cl. 423—222 12 Claims

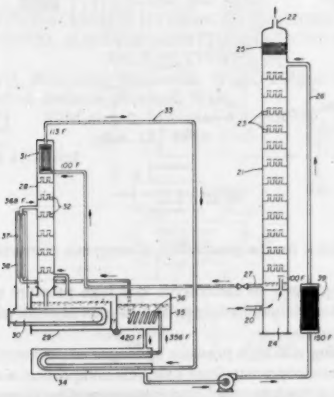


1. A method of purifying a hydrogenated gas containing carbon monoxide and hydrogen sulphide, the method comprising a hydrogen sulphide elimination step and at least one carbon monoxide elimination step, wherein the improvement comprises catalytic conversion of carbon monoxide at a temperature of from 280° C. to 350° C. followed by a hydrogen sulphide elimination step which comprises a reaction between sulphur dioxide and hydrogen sulphide to form sulphur, said reaction being performed in a solvent for sulphur dioxide and hydrogen sulphide at a temperature of from 0° to 200° C and at a pressure of from 1 to 150 atmospheres.

4,107,270
PROCESS FOR SIMULTANEOUS REMOVAL OF HYDROGEN SULFIDE AND WATER FROM A GAS MIXTURE WITHOUT SUBSTANTIAL REMOVAL OF CARBON DIOXIDE OR HYDROCARBONS

Charles Robert Ferrin, and William Patrick Manning, both of Tulsa, Okla., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Jun. 20, 1977, Ser. No. 807,936
Int. Cl.[2] B01D *53/34*
U.S. Cl. 423—226 4 Claims



1. The process for the separation of hydrogen sulfide and water from a mixture of natural gases which may also contain carbon dioxide, which comprises,

scrubbing the mixture of gases with a liquid, high boiling organic absorbent selected from the group consisting of 1-formyl piperidine and alkylated derivatives of 1-formyl piperidine in an absorption zone above atmospheric pressure to thereby absorb both the hydrogen sulfide and water but substantially less of the carbon dioxide and hydrocarbons,

conducting the absorbent containing the hydrogen sulfide and water to a desorption zone at atmospheric pressure

liberating the absorbed hydrogen sulfide and water from the absorbent to thereby regenerate the absorbent,

and recycling the regenerated absorbent to the absorption zone.

4,107,271
WET-TREATMENT OF EXHAUST GASES

Masumi Atsukawa; Naoharu Shinoda, and Takeji Tanaka, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 27, 1976, Ser. No. 690,785
Claims priority, application Japan, Jun. 6, 1975, 50-67467
Int. Cl.[2] C01B *21/00*
U.S. Cl. 423—235 3 Claims

1. In a process for the aqueous absorption treatment of an exhaust gas to remove simultaneously both oxides of nitrogen (NO_x) and oxides of sulphur (SO_x) from the exhaust gas, wherein the process comprises washing and contacting the exhaust gas with a slurry of lime or limestone, containing an aqueous solution of an alkali metal iodide, alkaline earth metal iodide or mixture of alkali metal iodide and alkaline earth metal iodide, (a) wherein said lime or limestone slurry reacts with (SO_x) thereby removing the sulphur oxides from the exhaust gas and (b) wherein said alkali metal iodide, alkaline earth metal iodide or mixture of alkali metal iodide and alkaline earth metal iodide remove (NO_x) from the exhaust gas;

the improvement comprising

(1) treating at least a portion of the aqueous solution of alkali metal iodide, alkaline earth metal iodide, or mixture of alkali metal iodide and alkaline metal iodide, after the aqueous solution contacts said exhaust gas in (a) and (b), with an amount of an oxidizing agent selected from the group consisting of chlorine, ozone, hydrogen peroxide, or nitrogen dioxide effective to convert substantially all iodide to iodine, said iodine being in the form of a gas or a solid,

(2) separating said iodine from the aqueous solution resulting from treatment with said oxidizing agent and recovering iodine;

(3) and further processing said iodine and the separated aqueous solution of (2)

(i) by reducing said recovered iodine with an agent selected from the group consisting of sulphurous acid, lime sulphite and mixtures thereof to regenerate iodide,

wherein said regenerated iodide is mixed with lime or limestone slurry and recycled for use in (a) and (b) to remove both oxides of nitrogen (NO_x) and oxides of sulphur (SO_x) from said exhaust gas, and

(ii) by neutralizing said separated aqueous solution, heating and concentrating said separated aqueous solution by a high temperature exhaust gas before said gas enters an exhaust gas cooling and dusting apparatus to remove impurities comprising NaCl, $CaCl_2$, $HON(SO_3)_2Ca$, $[N(SO_3)_3]_2Ca_3$ or mixures thereof which are contained in the liquid to convert them into solid waste materials.

4,107,272
PROCESS FOR REMOVING NITROGEN OXIDES USING AMMONIA AS A REDUCTANT AND SULFATED METALLIC CATALYSTS

Toshikatsu Mori, Hitachi; Masato Takeuchi, Katsuta; Otane Hitomi, Hitachi; Shigeo Uno, Hitachi; Jinichi Imahashi, Hitachi, and Fumito Nakajima, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Continuation of Ser. No. 471,151, May 17, 1974, abandoned.
This application Jan. 25, 1977, Ser. No. 762,267
Claims priority, application Japan, May 21, 1973, 48-57080
Int. Cl.[2] B01J *8/00*; C01B *21/00*
U.S. Cl. 423—239 20 Claims

1. In a process for removing nitrogen oxides from a flue gas

wherein the flue gas is contacted with ammonia in the presence of a catalyst at elevated temperatures to reduce the nitrogen oxides to nitrogen, the improvement wherein said flue gas contains 100 to 1000 ppm in volume of nitrogen oxides, 200 to 1500 ppm in volume of sulfur oxides and 1 to 7% by volume of oxygen, the flue gas is mixed with ammonia gas in an amount of more than equivalents of nitrogen oxides, and the flue gas and ammonia mixture is contacted with a catalyst initially containing at least one metallic atom M selected from the group consisting of Fe, Cu, V, Mn, Ni, and Cr, and a group SO_x, wherein x is 1.5 to 4.

4,107,273
FLUORESCENT MATERIAL

Atsushi Suzuki, Hachioji, Japan, and Jean-Pierre Jeser, Esslingen, Fed. Rep. of Germany, assignors to Hitachi, Ltd., Japan

Filed Oct. 28, 1977, Ser. No. 846,535
Claims priority, application Japan, Nov. 12, 1976, 51/135333
Int. Cl.² C09K *11/46*
U.S. Cl. 423—263 **4 Claims**

1. An infrared ray excited - infrared ray emitting fluorescent material represented by the following formula:

$$MM'_{1-x-y}Nd_xYb_yP_4O_{12}$$

where M denotes at least one element selected from the group consisting of Li, Na, K, Rb and Cs, and M′ denotes at least one element selected from the group consisting of Sc, Y, La, Ce, Gd, Lu, Ga and In, and where $0.05 \leqq x \leqq 0.999$, $0.001 \leqq y \leqq 0.950$, and $x + y \leqq 1.0$; the maximum luminescence wavelength of said fluorescent material being approximately 980 nm.

4,107,274
PROCESS FOR PREVENTING CAKING AND OBTAINING FLOWABILITY OF ALKALI CHLORIDES AND SALT MIXTURES THEREOF

Helmut Knorre, Seligenstadt; Joachim Fischer, and Gerhard Pohl, both of Hanau, all of Germany, assignors to Duetsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

Division of Ser. No. 579,158, May 20, 1975, Pat. No. 4,051,228. This application Apr. 29, 1977, Ser. No. 792,471
Claims priority, application Fed. Rep. of Germany, Nov. 29, 1974, 2456434
The portion of the term of this patent subsequent to Sep. 14, 1993, has been disclaimed.
Int. Cl.² C01G *3/26*
U.S. Cl. 423—268 **14 Claims**

1. A flowable alkali metal chloride composition resistant to caking on storage including as an anticaking agent (A) a complex iron cyanide (B) a water insoluble, inorganic, inert, finely divided hydroxyl group containing precipitated or pyrogenically formed metal oxide or metalloid oxide carrier material, (C) a hydrophobizing material and (D) a polycarboxylate hydrophilizing material, said materials (A), (C) and (D) being present on B, said anticaking agent providing a permanent moisture content of at least 0.01 weight % of water on the salt.

9. A process of preparing the product of claim 7 comprising adding (A) to (C) and (D) on the hydroxyl group containing (B) carrier to the alkali metal chloride.

4,107,275
METHOD FOR PRODUCING NF_4BF_4

Karl O. Christe, Calabasas; Carl J. Shack, Chatsworth, and Richard D. Wilson, Canoga Park, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 12, 1976, Ser. No. 731,198
Int. Cl.² C01B *35/14*
U.S. Cl. 423—276 **5 Claims**

1. Improved metathetical process for the production of NF_4BF_4, comprising the steps of combining $CsBF_4$ with a 0–15 mol % excess of NF_4SbF_6 in anhydrous HF at room temperature, cooling the mixture to −78° C and removing the $CsSbF_6$ precipitate by filtration at −78° C.

4,107,276
MANUFACTURE OF HEXAGONAL BORON NITRIDE

Karl Alex Schwetz, Sulzberg; George Vogt, Kempten-Sankt Mang, and Alfred Lipp, Bad Worishofen, all of Fed. Rep. of Germany, assignors to Elektroschmelzwerk Kempten GmbH, Herzog-Wilheim-Strasse 16, Fed. Rep. of Germany

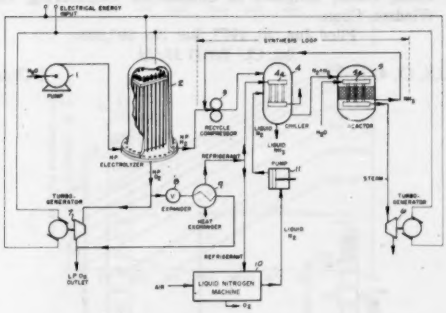
Continuation-in-part of Ser. No. 644,399, Dec. 29, 1975, abandoned. This application Jun. 20, 1977, Ser. No. 808,212
Claims priority, application Fed. Rep. of Germany, Dec. 30, 1974, 2461821
Int. Cl.² C01B *35/08*
U.S. Cl. 423—290 **15 Claims**

1. A process for the manufacture of hexagonal boron nitride which comprises, reacting a starting material selected from the group consisting of an alkali metal hexaboride, an alkali metal dodecaboride, an alkaline earth metal hexaboride and an alkaline earth metal dodecaboride with a grain size having a minimum BET surface of 1 m^2/g, with nitrogen at a temperature of at least about 900° C and a nitriding gas pressure of at least 1 bar, in the presence of at least one additive in the amount of at least 2% by weight, selected from the group consisting of B_2O_3, boric acid, boron carbide, an alkaline earth metal borate, carbon and iron.

4,107,277
PROCESS FOR PRODUCTION OF AMMONIA

Aldo Vieira da Rosa, P. O. Box 443, Palo Alto, Calif. 94302

Filed Jul. 13, 1976, Ser. No. 704,772
Int. Cl.² C01C *1/04*
U.S. Cl. 423—359 **3 Claims**



1. A process for the production of ammonia comprising the steps:

subjecting water to electrolysis in a high pressure electrolyzer to produce hydrogen and oxygen at relatively high pressures;

introducing said high pressure hydrogen so produced into a synthesis loop comprising a recycle compressor, a chilling vessel, a reactor vessel, and interconnecting piping;

expanding said high pressure oxygen so produced in a first heat exchanger having a refrigerant circulating loop thereby effecting the cooling of said refrigerant;

circulating said refrigerant through said refrigerant circulating loop and through a second heat exchanger;

introducing nitrogen into said second heat exchanger thereby effecting liquefaction of said nitrogen;

introducing said liquid nitrogen into said chilling vessel thereby vaporizing said nitrogen and forming a mixture with said hydrogen from said synthesis loop and simultaneously cooling said mixture;

introducing said mixture of hydrogen and nitrogen into said reactor vessel thereby producing ammonia vapor;
circulating said ammonia vapor through said chilling vessel;
condensing said ammonia vapor in said chilling vessel;
removing said ammonia from said chilling vessel.

4,107,278

PROCESS FOR MAKING HCN

Victor Kai-Kuo Wang, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 16, 1976, Ser. No. 714,353
Int. Cl.² C01C *3/02*
U.S. Cl. 423—376 **5 Claims**

1. A process for increasing the yield of HCN in an Andrussow-type process for the synthesis of HCN by the vapor-phase reaction of methane with ammonia and oxygen in the presence of a noble metal oxidation catalyst, which comprises: feeding a mixture of reactant gases over the entire catalyst surface, said reactant gas mixture having a volume ratio of methane to oxygen in the range of about 0.9–1.5 and containing about 0.5–20% by volume of CO_2, whereby the conversion of CH_4 to HCN is increased by at least about 6% by volume.

4,107,279

PROCESS FOR THE PREPARATION OF AMIDOSULFONIC ACID

Reinhold Gräser, Frankfurt am Main; Heinz Karl Hofmeister, Kelkheim, and Adolf Metzger, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 22, 1977, Ser. No. 826,712
Claims priority, application Fed. Rep. of Germany, Aug. 24, 1976, 2637948
Int. Cl.² C01B *17/00*
U.S. Cl. 423—389 **6 Claims**

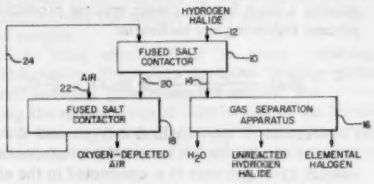
1. A process for the preparation of amidosulfonic acid consisting essentially of reacting sulfur trioxide and ammonia to produce a melt of reaction products; and reacting the melted reaction products directly with a mineral acid.

4,107,280

OXIDATION OF HYDROGEN HALIDES TO ELEMENTAL HALOGENS WITH CATALYTIC MOLTEN SALT MIXTURES

Charles A. Rohrmann, Kennewick, Wash., assignor to Battelle Memorial Institute, Richland, Wash.

Filed Aug. 1, 1977, Ser. No. 820,733
Int. Cl.² C01B *7/00*
U.S. Cl. 423—502 **16 Claims**



1. A process for regenerating an elemental halogen, selected from chlorine, bromine and iodine, from a corresponding hydrogen halide comprising:
contacting a hydrogen halide in the substantial absence of an oxygen-bearing gas, with a molten salt mixture which includes a dissolved oxygen compound capable of reacting with said hydrogen halide to produce an elemental halogen and water; and
maintaining said salt mixture during said contacting at an elevated temperature sufficient to sustain a reaction between said oxygen compound and said hydrogen halide to produce a gaseous effluent, substantially free of gaseous oxygen and containing primarily steam and said elemental halogen along with a smaller amount of unreacted hydrogen halide.

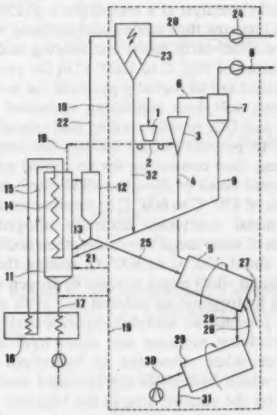
13. A process for regenerating elemental chlorine from hydrogen chloride comprising:
in the substantial absence of an oxygen-bearing gas, contacting hydrogen chloride with a molten salt mixture comprising 5 to 25 wt. percent K_2SO_4, 50 to 90 wt. percent $K_2S_2O_7$ and 2 to 25 wt. percent V_2O_5;
during said contacting, maintaining said salt mixture at an elevated temperature sufficient to sustain a reaction between vanadium in its higher valence state (V^{+5}) and said hydrogen chloride whereby at least a portion of said vanadium, which is dissolved in said salt mixture, is reduced to a lower valence state and whereby a gaseous effluent, substantially free of gaseous oxygen and containing primarily steam and chlorine gas along with unreacted hydrogen chloride, is produced;
separating said effluent from the resulting salt mixture containing said reduced vanadium; and
contacting said salt mixture containing said reduced vanadium with an oxygen-bearing gas at an elevated temperature sufficient to sustain a reaction between oxygen in said oxygen-bearing gas and said dissolved, reduced vanadium to thus regenerate said vanadium to its higher valence state so that said salt mixture may be used for contacting additional amounts of said hydrogen chloride.

4,107,281

PROCESS FOR THE THERMAL DECOMPOSITION OF ALUMINUM CHLORIDE HEXAHYDRATE TO OBTAIN ALUMINA

Lothar Reh, Bergen-Enkheim; Ludolf Plass, Kronberg, both of Fed. Rep. of Germany, and Philippe Marchessaux, Chemin des Trois Moulins, France, assignors to Aluminum Pechiney, Lyon, France

Filed Aug. 11, 1977, Ser. No. 823,643
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1976, 2636855
Int. Cl.² C01F *7/30*
U.S. Cl. 423—625 **9 Claims**



1. A continuous process for the thermal decomposition of aluminum chloride hydrate into solid aluminum oxide and gaseous hydrogen chloride comprising
(1) introducing the aluminum chloride hydrate into a thermal reaction zone,
(2) introducing a fluidizing gas into the reaction zone to maintain the aluminum chloride hydrate in a fluidized state within said reaction zone,
(3) indirectly heating the aluminum chloride hydrate while

in the fluidized state in said thermal reaction zone until a predominant portion of the thermal composition of the aluminum chloride hydrate has taken place in the reaction zone,

(4) separating the effluent from the thermal reaction zone into a gaseous phase containing hydrogen chloride and a solid phase of partially decomposed aluminum chloride hydrate,

(5) passing the separated solid phase of partially decomposed aluminum chloride hydrate to a rotary calcination zone,

(6) directly heating the partially decomposed aluminum chloride hydrate in the calcination zone to calcining temperature substantially to complete the thermal decomposition of the aluminum chloride hydrate to hydrogen chloride and solid aluminum oxide.

(7) cooling the solid aluminum oxide from the calcining zone, and

(8) processing the gaseous phase from step 4 for removal of entrained solids.

4,107,282
ACETYLIDE CATALYST AND PROCESS OF PRODUCING HYDROGEN

Van Michaels Christopher, 1817½ N. Las Palmas Ave., Hollywood, Calif. 90028

Continuation-in-part of Ser. No. 445,792, Feb. 25, 1974, abandoned, and Ser. No. 552,802, Feb. 24, 1975, abandoned. This application Oct. 22, 1976, Ser. No. 735,110

Int. Cl.[2] **B01J** *37/28;* **C01B** *1/08*

U.S. Cl. 423—657 **4 Claims**

1. A species of hydrogenating fuel alloys evolving liquid and gaseous hydrocarbons when submitted to recycling hydrolysis and acidolysis which can be done both at room temperature and atmospheric pressure and at high pressure controlled in the range of 250 to 400 atmospheres to profit the fuel alloys' hydrogenating property said alloys being based on alloying hydrocarbonides with hydrides cobalt, nickel, chromium oxide and molybdenum oxide as catalysts and with powdered carbon comprising the following steps:

(a) incomplete burning of carbonaceous materials to produce carbon monoxide, reacting said carbon monoxide with hydrogen plasma from Nascent Hydrogen in the presence of to nickel catalyst at a temperature of 250° C to 400° C to form methane then mixing said methane with vapour of alkali or alkali-earth metal and heating said mixture at a temperature of 900° C to 1200° C in the presence of halogen catalyst salt to partially pyrolyse the methane thereby producing acetylene containing unreacted methane, hydrogen and CO, rapidly cooling said mixture to 550° C to 600° C to prevent partial thermal decomposion of said acetylene, then contacting the so cooled gaseous mixture with liquid alkali or fluidised alkali-earth metal at a temperature of 450° C to 600° C to produce an alkali or alkali-earth metal acetylide, naturally alloyed with small amounts of same metal's hydrides, then cooling said acetylide to about 350° C to 400° C, mixing them with additional liquid alkali metal, nascent hydrogen with the above defined hydrogenating catalyst and with powdered carbon to produce an acetylide-hydride-catalystcarbon fuel alloy evolving methane and other hydrcarbons but no acetylene when submitted to hydrolysis or acidolysis during which hydrolysis the liberated nascent hydrogen helped by the catalyst attacks the liberated acetylene and hydrogenate it immediatly to methane and other hydrocarbons, said nascent hydrogen hydrogenating predominantly the carbon constituent of the fuel alloy and producing predominantly liquid hydrocarbons when the acidolysis is conducted at the above stated high self-pressures high temperature where the catalyst is chromium oxide, molybdenum oxide or a mixture of both alloyed together with the other constituent of the recyclable alloy;

(b) incomplete burning of carbonaceous materials to produce carbon monoxide then passing said carbon monoxide through the bottom of a fluidising bed containing powdered mixture of carbon, iron, halides, oxides and hydroxides, manganese halides oxides and hydroxides to react with them under their melting points at 600° C to 1,000° C in the presence of CO_2 and hydrogen to lower the partial pressure of CO thus to evaporate the halides, self catalysts and thus to produce a powdered iron hydrocarbonide - manganese hydrocarbonide M_3C - carbon fuel alloy dopped with chromium and molybdenum oxides as hydrogenating catalysts which alloy is then passed into an oil quenching bed to rapidly quench the fuel alloy down to 55° C or lower which converts the different iron hydrocarbonide constituents to cementite hydrocarbonide Fe_3C permitting better yield of liquid hydrocarbons which hydrocarbons are liberated: during a recycling the feed stock cold hydrolysis when the manganese hydrocarbonide Mn_3C is more then 85%; during boiling hydrolysis when the Mn_3C is from 60 to 80%; during boiling acidolysis when the Mn_3C is below 60% said liquid hydrocarbons being evolved in significantly increasing yield when the fuel alloy is submitted to the above stated high self pressure and high temperature hydrogenating acid hydrolysis which yield is again increased when to the fuel alloy is added 5% to 10% uranium sesquicarbide U_2C_3 which must be produced separately from powdered mixture of uranium hydroxide, oxides, halides and excess carbon of up to 70% and more by atoms again with carbon monoxide in the presence of CO_2 and hydrogen heated at 1000° C to 1500° C where the excess carbon and the above specific temperature range serve to suppress the formation of other uranium carbides which differ from U_2C_3 are refractive and not evolving hydrocarbons; and

(c) a final mixing of alloys (a) with alloys (b) for further better yield and doping the mixture with neutral surfactant or other neutral substance to prevent the alloy from oxidation with moist air during storage.

2. The process of manufacturing nascent hydrogen H+ concurrently with oxygen of claim 1 from water without burden products or reducing substances not possible with any existing process said manufacturing employing my original process of manganese low temperature thermal splitting of the water possible only through the use of manganese oxides based specifically on the unique property of the manganese dioxide MnO_2 for pyrolytic self reduction to Mn_2O_3 at over 530° C and to Mn_3O_4 at over 940° C combined with the reverse property of the obtained Mn_2O_3 for back self oxidation to MnO_2 below 530° C in the presence of air or steam comprising the steps:

(a) introducing into a reactor powdered MnO_2 feed stock then submitting it to thermal self reduction through pyrolysis only at over 530° C and pressure of 1 to 100 atmospheres liberating an abundance of O_2 avoiding all the while any burden products catalysts or reducing substances, a must for the classic process producing H_2, my process following the technique:

$$MnO_2 \xrightarrow[1 \text{ to } 100 \text{ atm}]{t^\circ > 530^\circ C} Mn_2O_3 + \frac{1}{2} O_2,$$

(b) evacuation of the obtained oxygen and fluidizing the obtained Mn_2O_3 with hot steam which reduces the steam to nascent hydrogen ions H+ conducted in the abscence of air at 1 to 100 atmospheres of pressure and temperature below 530° C but not below 100° C which splits the H_2O into 2H+ and O− oxidising the Mn_2O_3 back to MnO_2 ready to be used for a new pyrolysis cycle again without burden products or reducing substances as follows:

$$Mn_2O_3 + H_2O(\text{steam}) \xrightarrow[1 \text{ to } 100 \text{ atm}]{530^\circ C > t^\circ > 100^\circ C} 2MnO_2 + 2H+, \text{ and}$$

(c) continuous alternation of step (a) with step (b) during which the obtained H+ and O, are used immediately for the purpose of claim 1 in order to prevent the recombina-

tion of the H+ into molecular H_2 combined with using the hydrogen in its molecular state for other purposes.

4,107,283

TRACER FOR CIRCULATION DETERMINATIONS

Frederick P. Pratt, East Somerville, and David L. Gagnon, North Billerica, both of Mass., assignors to New England Nuclear Corporation, Boston, Mass.

Filed Jul. 19, 1976, Ser. No. 706,434

Int. Cl.[2] A61K *29/00, 43/00*

U.S. Cl. 424—1 **40 Claims**

38. An injectable preparation for use in making circulatory system measurements comprising cores of ion exchange resin having a polymeric coating in a physiologically acceptable liquid carrier, said ion exchange resin being selected from the group consisting of a cationic exchange resin having both radioactive cations and H+ ions and an anionic exchange resin having both radioactive anions and OH^- anions, and said polymeric coating comprising a polymer selected from the group consisting of a polymer, the polymerization of which is catalyzed by H+ cations, and a polymer the polymerization of which is catalyzed by OH^- anions.

4,107,284

RADIOIMMUNOASSAY PROCEDURE USING A STABILIZED COMPLEX

Ishkhan V. Sultanian, 2729 Sandpiper Ave., Costa Mesa, Calif. 92626, and Joseph H. Irani, 3207 Broad St., Newport Beach, Calif. 92663

Filed Oct. 28, 1975, Ser. No. 626,228

Int. Cl.[2] A61K *43/00;* **G01N** *33/00*

U.S. Cl. 424—1 **10 Claims**

1. A stabilized radioactive isotope labelled antigen-antibody complex for use in radioimmunoassay procedures comprising:

a mixture of a labelled antigen and an antibody specific to said antigen,

said antigen being selected from the group consisting of triiodothyronine, thyroxine, thyroxine binding globulin, cortisol, estradiol, gentamicin and estrone, and

a plurality of stabilizers present in said mixture in an amount effective to inhibit the labelled antigen from associating with protein other than said specific antibody.

6. A radioimmunoassay procedure for quantitatively determining the concentration of an antigen comprising the steps of:

providing a stabilized radioactive isotope labelled antigen-antibody complex including a plurality of stabilizers present in an amount sufficient to provide a shelf life for said complex of between four to six weeks;

admixing the antigen to be determined with said complex whereby a portion of the antigen to be determined becomes bound to the antibody of said complex, separating the complex and the antigen bound thereto from the unbound antigen,

said antigen being selected from the group consisting of triiodothyronine, thyroxine, thyroxine binding globulin, cortisol, estradiol, gentamicin and estrone, and

measuring the radioactivity at least of one of the bound or unbound antigen whereby the value of said radioactivity is a function of the quantity of the antigen to be determined.

4,107,285

RADIOIMMUNOASSAY FOR METHAQUALONE

James Gordon Christenson, North Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 616,451, Sep. 24, 1975, Pat. No. 4,053,459. This application Jul. 5, 1977, Ser. No. 813,206

Int. Cl.[2] G01N *33/16;* **C07D** *239/00*

U.S. Cl. 424—1 **4 Claims**

1. A method for the assay of methaqualone and its metabolites in a sample, which method comprises mixing said sample with a known amount of a labeled methaqualone derivative and an antibody which will selectively complex with said methaqualone and its metabolites, and with said labeled methaqualone derivative, measuring the degree of binding of said labeled methaqualone derivative with said antibody, and determining the amount of methaqualone and its metabolites present in such sample by comparing said degree of binding to a standard curve obtained by mixing known amounts of methaqualone and/or its metabolites with fixed amounts of said labeled methaqualone derivative.

4,107,286

POLYIODS BENZENE DERIVATIVES AND X-RAY CONTRAST MEDIA CONTAINING THE SAME

Guy Tilly; Michel Jean-Charles Hardouin, and Jean Lautrou, all of Aulnay-sous-Bois, France, assignors to Guerbet S.A., Aulnay-sous-Bois, France

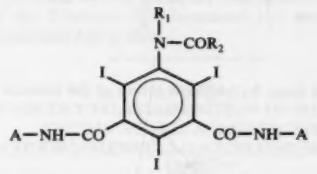
Filed Mar. 29, 1977, Ser. No. 782,413

Claims priority, application United Kingdom, Apr. 8, 1976, 14343/76

Int. Cl.[2] A61K *29/02;* **C07C** *101/42*

U.S. Cl. 424—5 **8 Claims**

1. A compound selected from a compound of the formula:



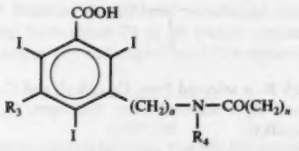
(I)

in which:

R_1 is selected from hydrogen, C_{1-4} alkyl and C_{1-4} hydroxyalkyl,

R_2 is selected from C_{1-4} alkyl and C_{1-4} hydroxyalkyl,

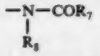
A represents a group of the formula:



in which:

R_3 is selected from: hydrogen; a group of the formula

in which R_5 and R_6 are independently selected from hydrogen, C_{1-4} alkyl and C_{1-4} hydroxyalkyl; and a group of the formula

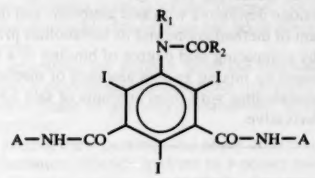


in which R_7 is selected from C_{1-4} alkyl and C_{1-4} hydroxyalkyl and R_8 is selected from hydrogen, C_{1-4} alkyl and C_{1-4} hydroxyalkyl,

a is an integer from 0 to 1 and *n* is an integer from 1 to 5,

R_4 is selected from hydrogen, C_{1-4} alkyl and C_{1-4} hydroxyalkyl, its methyl and ethyl esters and its salt with a pharmaceutically acceptable base.

4. X-ray contrast medium, comprising an effective amount of a compound selected from a compound of the formula:



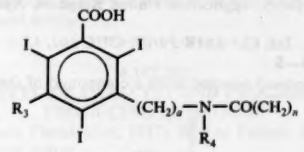
(I)

in which:

R_1 is selected from hydrogen, C_{1-4} alkyl and C_{1-4} hydroxyalkyl,

R_2 is selected from C_{1-4} alkyl and C_{1-4} hydroxyalkyl,

A represents a group of the formula:



in which:

R_3 is selected from: hydrogen; a group of the formula

in which R_5 and R_6 are independently selected from hydrogen, C_{1-4} alkyl and C_{1-4} hydroxyalkyl; and a group of the formula

in which R_7 is selected from C_{1-4} alkyl, and C_{1-4} hydroxyalkyl and R_8 is selected from hydrogen, C_{1-4} and C_{1-4} hydroxyalkyl,

a is an integer from 0 to 1 and *n* is an integer from 1 to 5,

R_4 is selected from hydrogen, C_{1-4} alkyl and C_{1-4} hydroxyalkyl, its methyl and ethyl esters and its salt with a pharmaceutically acceptable base, in a pharmaceutically acceptable carrier.

4,107,287

GC ANTIGEN-SPECIFIC IMMUNOCHEMICAL INDICATOR REAGENT AND METHOD FOR PREPARING SAME

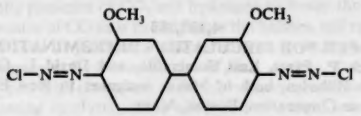
Harry E. Morton, Drexel Hill, and Gow T. Lam, Philadelphia, both of Pa., assignors to University of Pennsylvania, Philadelphia, Pa.

Filed Apr. 12, 1976, Ser. No. 675,879

Int. Cl.[2] G01N *31/00, 31/02, 31/22, 33/16*

U.S. Cl. 424—8 **9 Claims**

1. An immunochemical indicator reagent capable of indicating the presence of specific antigenic or haptenic material by hemagglutination reaction therewith, comprising a first moiety consisting of fixed enzyme-treated erythrocyte carrier particles whose surfaces are provided with exposed active hydrogen-containing groups including free amino groups, and a second moiety consisting of antibody globulin molecules having specific reactivity toward said specific antigenic or haptenic material and also having exposed active hydrogen-containing groups including free amino groups, said first and second moieties being chemically coupled together through a bifunctional chlorine-terminated coupling agent selected from the group consisting of diazo blue B having the formula



and diazo blue B-terminated condensation products of diazo blue B with glycine, each of said first and second moieties being covalently bound to opposite ends of said coupling agent predominantly through chemical linkages formed by reaction between the respective chlorine-terminated ends of said coupling agent and the free amino groups of the respective moieties.

2. The immunochemical indicator reagent of claim **1**, wherein said first moiety consists of glutaraldehyde-fixed trypsinized erythrocyte carrier particles.

4,107,288

INJECTABLE COMPOSITIONS, NANOPARTICLES USEFUL THEREIN, AND PROCESS OF MANUFACTURING SAME

Richard Charles Oppenheim, Parkville; Jennifer Joy Marty, East Kew, both of Australia, and Peter Speiser, Zurich, Switzerland, assignors to Pharmaceutical Society of Victoria, Parkville, Australia

Filed Sep. 9, 1975, Ser. No. 611,835

Claims priority, application Australia, Sep. 18, 1974, 8951/74

Int. Cl.[2] A61K *9/66, 9/64*

U.S. Cl. 424—22 **18 Claims**

1. A process of manufacturing particles in the size range from about 10 to about 1000 nanometres which particles comprise a crosslinked matrix of macromolecules of natural origin, which method consists essentially of:

(a) solvating the macromolecules to form a thermally equilibrated clear solution;

(b) treating said solution with a desolvating agent until the macromolecules have reached the desolvation region which is the region at which the intensity of scattered light is markedly increased, but before the point at which the solution becomes turbid; and,

(c) adding an aldehyde hardening agent to the mixture.

9. Particles in the size range from about 10 to about 1000 nanometres which particles comprise a crosslinked matrix of macromolecules of natural origin, said particles having been formed by the process of claim **1**.

4,107,289

USE OF SUBSTITUTED PYRANS AS DEODORANT CHEMICALS

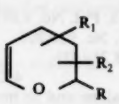
Jerome G. Kaufman, East Norwich, N.Y., assignor to Naarden International Holland, B.V., Naarden-Bussum, Netherlands

Continuation-in-part of Ser. No. 602,958, Aug. 7, 1975, abandoned. This application Jul. 29, 1976, Ser. No. 709,668

Int. Cl.[2] A61L *9/04*

U.S. Cl. 424—45 **17 Claims**

1. A process for the chemical destruction of malodors imparted by compounds, by the formation of addition products across the double bond in a substituted pyran compound having the general formula:



wherein R_1 and R_2 are each selected from the group consisting of hydrogen, lower alkyl and cycloalkyl and R represents an organic radical, which comprises;

providing said pyran compound in admixture with a carrier substrate; and
forming said addition products.

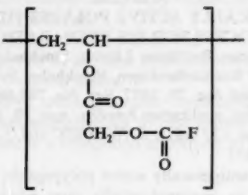
4,107,290

ANTI-SOLAR POLYMERS, METHOD OF MAKING THE SAME AND COSMETIC COMPOSITIONS CONTAINING THE SAME

Bernard Jacquet, Antony; Christos Papantoniou, Epinay-sur-Seine; Pierre Dufaure, and Claude Mahieu, both of Paris, all of France, assignors to L'Oreal, Paris, France

Continuation-in-part of Ser. No. 374,059, Jun. 27, 1973, Pat. No. 3,992,356. This application Aug. 18, 1976, Ser. No. 715,566
Claims priority, Application France Jul. 29, 1976 7623175, application Luxembourg, Jun. 29, 1972 65622
Int. Cl.[2] A61K *7/42, 7/44*
U.S. Cl. 424—47 **11 Claims**

1. An anti-solar cosmetic composition comprising an aqueous, hydroalcoholic or oily solution containing an amount to assure protection against wave lengths of light in the erythematous zone of at least one anti-solar polymer containing in the macromolecular chain thereof at least one unit having the formula



wherein F is a residue derived from an aromatic compound which imparts to the said polymer the ability to absorb wave lengths of light in the range of about 280–315 millimicrons and at least one unit derived from an ethylenically unsaturated monomer present in an amount of about 20–90 percent of the total weight of the polymer.

4,107,291

COMPOSITIONS FOR CLEANING TEETH AND ORAL CAVITY

Keijiro Ishibashi, Tokyo, Japan, assignor to Sankyo Company Limited, Tokyo, Japan

Continuation of Ser. No. 43,224, Jun. 3, 1970, abandoned. This application Mar. 23, 1972, Ser. No. 237,577
Claims priority, application Japan, Jun. 5, 1969, 44-44210
Int. Cl.[2] A61K *7/28, 9/68*
U.S. Cl. 424—48 **24 Claims**

1. A method for cleaning teeth and oral cavity which comprises applying a sufficient amount of invertase to exert said cleaning effect to teeth and oral cavity.

4,107,292

STABLE WATER DISPERSIONS OF ENCAPSULATED PARATHION

Harold C. Nemeth, Chicago, Ill., assignor to Akzona Incorporated, Asheville, N.C.

Continuation of Ser. No. 457,152, Apr. 1, 1974, abandoned, which is a continuation-in-part of Ser. No. 230,935, Mar. 1, 1972, abandoned. This application Feb. 16, 1977, Ser. No. 769,362
Int. Cl.[2] A01N *9/36*
U.S. Cl. 424—78 **8 Claims**

1. An insecticidal composition consisting essentially of an aqueous dispersion of:
(a) from about 1% to about 40% by weight of said composition of capsules of a member of the group consisting of a phosphoromonothioate and a phosphorodithioate insecticide encapsulated in a skin selected from the group consisting of a polyamide, a polyurea, and a mixed polyamide-polyurea cross-linked with a cross-linking agent selected from the group consisting of a polyalkylene polyamine and a polyfunctional isocyanate;
(b) from about 0.1% to about 0.5% by weight of said composition of a xanthan gum dispersant for said capsules; and
(c) balance water.

4,107,293

ATTRACTANT FOR DARKSIDED CUTWORM MOTH

G. Edward Swailes, and Dean L. Struble, both of Lethbridge, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Mar. 25, 1977, Ser. No. 781,507
Int. Cl.[2] A01N *17/14*
U.S. Cl. 424—84 **7 Claims**

1. An attractant mixture for male moths of the darksided cutworm *Euxoa messoria* (Harris) comprising
(1) Z-11-hexadecen-1-yl acetate, and
(2) Z-7 compound selected from Z-7-hexadecen-1-yl acetate and Z-7, Z-11-hexadecadien-1-yl acetate and mixtures thereof,
in ratios of (1)/(2) within about 4:1 to about 40:1, and
(3) 0 to about 20% by wt. of the total mixture of at least one of the E-isomers E-11-hexadecen-1-yl acetate and E-7-hexadecen-1-yl acetate.

4,107,294

INSECTICIDAL COMPOSITION OF *BACILLUS THURINGIENSIS* ADMIXED WITH 1-(4-CHLOROPHENYL)-3-(2,6-DIFLUOROBENZOYL)-UREA

Abdul Rehman Chauthani, Riverside, Calif., assignor to Nutrilite Products, Inc., Buena Park, Calif.

Filed Jun. 27, 1977, Ser. No. 810,566
Int. Cl.[2] A01N *9/02, 9/20, 15/00*
U.S. Cl. 424—93 **7 Claims**

1. An insecticidal composition comprising an admixture of from about 70 to 30 weight percent by weight of total active materials of *Bacillus thuringiensis*, insecticidal material and concomitantly from about 70 to 30 weight percent of total active materials of 1-(4-chlorophenyl)-3-(2,6-difluorobenzoyl)-urea.

4,107,295

ANTIBIOTIC RUBRADIRIN B AND PROCESS FOR PREPARING THE SAME

Herman Hoeksema, Kalamazoo; Fritz Reusser, Portage, and Donald R. Wait, Paw Paw, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 783,817, Apr. 1, 1977, abandoned. This application Apr. 15, 1977, Ser. No. 787,833
Int. Cl.[2] A61K *35/00;* **G07F** *11/00*
U.S. Cl. 424—120 **7 Claims**

1. Essentially pure rubradirin B, a compound which
(a) is effective in inhibiting the growth of various bacteria;
(b) is soluble in dimethylformamide, dimethylsulfoxide and aqueous base, and is insoluble in aqueous acid and hydrocarbon solvents;
(c) has the following elemental analysis: C, 59.25; H, 4.38; N, 5.17;
(d) has a molecular weight of 795 (determined by field desorption mass spectroscopy);
(e) has a characteristic infrared absorption spectrum as shown in FIG. 1 of the accompanying drawings;
(f) has a characteristic ultraviolet absorption spectrum as shown in FIG. 2 of the accompanying drawings;
(g) has a melting point > 265° Dec.; and,
(h) has a molecular formula $C_{40}H_{33}N_3O_{15}$.

4. A process for recovering rubradirin B from a fermentation using *Streptomyces achromogenes* var. *rubradiris*, NRRL 3061, which comprises:

(a) filtering said fermentation beer to obtain a filtrate containing rubradirin B;
(b) adjusting the pH of the filtrate to about 4.0 to form a precipitate containing rubradirin B;
(c) removing said precipitate by filtration and eluting the filter cake which forms with a solvent for rubradirin B to give eluates containing rubradirin B;
(d) concentrating said eluates to a residue;
(e) leaching said residue with a solvent for rubradirin B and concentrating the solvent;
(f) diluting said solvent concentrate with a solvent in which rubradirin B is not soluble to form a precipitate containing rubradirin B;
(g) isolating and drying said precipitate containing rubradirin B to a solid; and,
(h) subjecting said solid containing rubradirin B to silica gel chromatography and isolating essentially pure rubradirin B.

4,107,296

ANTIBIOTIC RUBRADIRIN C

Herman Hoeksema, Kalamazoo, and Fritz Reusser, Portage, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Jun. 29, 1977, Ser. No. 810,955
Int. Cl.[2] A61K *35/00*
U.S. Cl. 424—121 **4 Claims**

1. Essentially pure rubradirin C, a compound which
(a) is effective in inhibiting the growth of *Streptococcus pyogenes* and *Bacillus cereus;*
(b) is soluble in dimethylformamide, dimethylsulfoxide and aqueous base, and is insoluble in aqueous acid and hydrocarbon solvents;
(c) has the following elemental analysis: C, 60.77; H, 4.45; N, 5.10;
(d) has a molecular weight of 779 (determined by field desorption mass spectroscopy);
(e) has a characteristic infrared absorption spectrum as shown in FIG. 1 of the accompanying drawings;
(f) has a characteristic ultraviolet absorption spectrum as shown in FIG. 2 of the accompanying drawings;
(g) has a melting point >300° Dec.; and,
(h) has a molecular formula $C_{40}H_{33}N_3O_{14}$.

4,107,297

ANTIBIOTIC COMPOUND

Satoshi Omura, Tokyo; Yuzuru Iwai, Narita, and Atsushi Hirano, Hasuda, all of Japan, assignors to The Kitasato Institute, Tokyo, Japan

Filed Nov. 28, 1977, Ser. No. 855,379
Claims priority, application Japan, Dec. 11, 1976, 51-148299
Int. Cl.[2] A61K *35/00*
U.S. Cl. 424—122 **5 Claims**

1. An antibiotic having the following characteristics
(1) Elementary analysis:
Found: C, 70.03%; H, 6.03%; N, 11.21%;
(2) Molecular weight:
m/e determined by mass spectrum, 466;
(3) Molecular formula: $C_{28}H_{26}N_4O_3$;
(4) Specific rotation: $[\alpha]_D^{25} = +35.0$ (C = 1.0 in methanol);
(5) Melting point: No clear melting point is shown; The compound turns brown at 208° C and assumes a tarry state at 260° C;
(6) Ultraviolet absorption spectrum (FIG. 1):
$\lambda_{max}^{MeOH_{nm}}$ ($E_{1cm}^{1\%}$): 243 (537), 267 (sh. 552), 292 (1228), 322 (sh. 537), 335 (313), 356 (220) 372 (254);
These peaks are not shifted in alkaline and acidic conditions;
(7) Infrared absorption spectrum (FIG. 2): By KBr method, there are absorptions observed at 3450 cm^{-1} due to the presence of amine and hydroxy groups, at 2960 cm^{-1} due to the presence of methyl and methylene groups, at 1675 cm^{-1} due to the presence of carbonyl and double bond groups, at 1588 cm^{-1}, 1460 cm^{-1}, 1356 cm^{-1}, 1322 cm^{-1}, 1285 cm^{-1}, 1230 cm^{-1}, 1123 cm^{-1} and 752 cm^{-1};
(8) Color reaction: Positive in Dragendorff reaction, Molisch reaction, Rydon-Smith reaction and ninhydrin reagent. Negative in Beilstein reaction, ferric chloride reagent and aniline phthalate reagent;
(9) Solubility in various solvents: soluble in dimethyl sulfoxide and dimethyl formamide; sparingly soluble in chloroform, ethyl acetate, n-butyl acetate and methanol; insoluble in petroleum ether, n-hexane and water;
(10) R_f values by chromatography: Thin layer chromatography using silica gel (Kieselgel G, 0.3 mm, commercially available from Merck Inc., U.S.A.) carried out in conventional manner gave the following R_f values:

Chloroform - methanol (10:1 V/V)	0.55
Benzene - acetone (1:2 V/V)	0.43
n-Butanol - acetic acid - water (8:1:0.5 V/V)	0.24

4,107,298

ANTIGENICALLY ACTIVE POLYPEPTIDE AND A PROCESS FOR ITS PREPARATION

Björn Erik Gustav Bertilsson Lüning, Stockholm, Sweden, assignor to AB Bonnierforetagen, Stockholm, Sweden

Filed Apr. 21, 1977, Ser. No. 789,665
Claims priority, application Sweden, Apr. 29, 1976, 7604972
Int. Cl.[2] A61K *37/00;* **C07C** *103/52*
U.S. Cl. 424—177 **12 Claims**

1. Synthetic antigenically active polypeptide, characterized by containing an immunologically inert portion and as an active immunological determinant group the amino acid sequence: A_{-3}-A_{-2}-A_{-1}-A_0-A_1-A_2-A_3, wherein A_0 is an arginine residue, A_1, A_2, A_{-1} and A_{-2} are same or different and selected from residues of: glycine, alanine, valine, leucine, lysine, and isoleucine and A_3 and A_{-3} are same or different and selected from glutamic acid and aspartic acid.

10. Synthetic antigenically active polypeptide, characterized by containing an immunologically inert portion and as an active immunological determinant group the amino acid sequence: Ala Leu Leu Asn Asp Glu Leu Ala Gln Tyr Leu Asp Leu Val Arg Ala Leu Glu Ala Ala Asn Gly Glu Leu Glu Val.

12. Synthetic antigenically active polypeptide, characterized by containing an immunologically inert portion and as an active immunological determinant group the amino acid sequence: Leu Asn Asp A_{-9} Leu Ala A_{-6} Tyr Leu Asp A_{-2} Val Arg Ala Leu Glu Ala Ala Asn Gly A_8 Leu Glu Val, wherein A_{-9} and A_8 are same or different and selected from residues of glutamic acid and arginine; A_{-6} is selected from residues of glutamine and lysine; and A_{-2} is selected from residues of leucine and lysine.

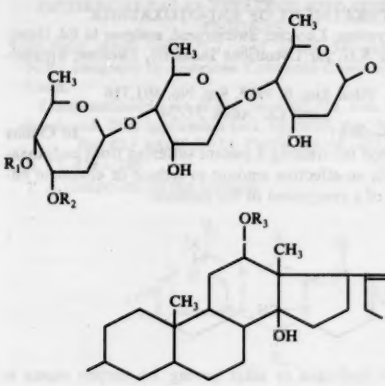
4,107,299

CARDIOACTIVE 12-EPI-DIGOXIN AND DERIVATIVES THEREOF

Fritz Kaiser, Lampertheim; Wolfgang Schaumann, Heidelberg, both of Germany; Kurt Stach, deceased, late of Mannheim-Waldhof, Germany; by Werner Plattner, administrator, Linz, Austria, and Wolfgang Voightlander, Viernheim, Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Germany

Filed Nov. 4, 1976, Ser. No. 738,808
Claims priority, application Fed. Rep. of Germany, Nov. 10, 1975, 2550354
Int. Cl.[2] A61K *31/705;* **C07J** *19/00*
U.S. Cl. 424—182 **9 Claims**

1. A 12-epi-digoxin of the formula



wherein

R_1 and R_2 each independently is hydrogen, an acyl radical or a lower alkyl radical,

R_3 is hydrogen or an acyl radical, and

R_4 is hydrogen or an aliphatic hydrocarbon radical containing up to 4 carbon atoms.

8. A method of treating cardiac insufficiency in a patient which comprises administering to said patient a cardioactive effective amount of a compound according to claim 1.

4,107,300
STABLE SOLID AGRICULTURAL CHEMICAL COMPOSITION AND PROCESS FOR PREPARATION THEREOF

Toshiie Nakamura, Kusatsu; Hiromichi Shimizu; Kyuichi Tanaka, both of Shiga; Akihiko Kunitomo, and Kinji Tanizawa, both of Moriyama, all of Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Filed Sep. 23, 1974, Ser. No. 508,354

Claims priority, application Japan, Sep. 28, 1973, 48-109024

Int. Cl.[2] A01N *9/36*

U.S. Cl. 424—200 **4 Claims**

1. A stable solid agricultural chemical composition comprising an unstable agricultural chemical active ingredient is an agriculturally effective amount selected from the group consisting of 3,3'-ethylenebis (tetrahydro-4,6-dimethyl-2H-1,3,5-thiadiazine-2-thione), zinc ethylenebisdithiocarbamate, manganese ethylenebisdithiocarbamate, methyl 1-(butylcarbamoyl)-2-benzimidazole carbamate, O,O-dimethyl-S-(N-methyl-N-formyl-carbamoylmethyl) phosphorodithioate, O,O-dimethyl-S-2-(ethylthio)ethyl phosphorodithioate, O,O-dimethyl O-(5-phenyl-3-isoxazolyl)phosphorothioate, 2-(p-tert-butylphenoxy)-isopropyl-2'-chloroethyl sulfite, 2-(p-tert-butylphenoxy)-1-ethyl-O-tolyl sulfite and cycloheximide, and a stabilizer selected from the group consisting of anhydrous calcium chloride, calcium chloride monohydrate, calcium chloride dihydrate and mixtures thereof, said stabilizer being present in an amount effective to stabilize the composition against deterioration due to elevated temperature and high humidity conditions.

4,107,301
O,O'-DIALKYL-O,O'-[2-AMINOPYRIMIDIN(4,6)DIYL]-BIS-[(THIONO)(THIOL)PHOSPHORIC(PHOSPHONIC) ACID ESTERS]

Wolfgang Hofer; Fritz Maurer; Hans-Jochem Riebel, all of Wuppertal; Ingeborg Hammann, Cologne, and Wolfgang Behrenz, Overath, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

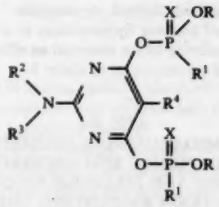
Filed Apr. 25, 1977, Ser. No. 790,351

Claims priority, application Fed. Rep. of Germany, May 6, 1976, 2620089

Int. Cl.[2] A61K *31/665;* **C07D** *139/50*

U.S. Cl. 424—200 **10 Claims**

1. An O,O'-dialkyl-O,O'-2-aminopyrimidin(4,6)-diyl-bis-(thiono/(thiol) phosphoric (phosphonic acid) ester of the formula



in which

R is alkyl with 1 to 5 carbon atoms,

R_1 is alkyl, alkoxy, or alkyl thio with 1 to 4 carbon atoms,

R^2 and R^3 each independently is alkyl with 1 to 3 carbon atoms or conjointly are an alkylene group with 3 to 5 carbon atoms which can be interrupted by an oxygen atom, R^4 is hydrogen, alkyl with 1 to 3 carbon atoms or halogen, and X is oxygen or sulphur.

4,107,302
NOVEL AQUEOUS INSECTICIDAL CONCENTRATE COMPOSITION

Hiroshi Watanabe, Takasago, Japan, assignor to Osaka Kasei Company Limited, Osaka and Nippon Kayaku Kabushiki Kaisha, Tokyo, both of, Japan

Filed Nov. 16, 1976, Ser. No. 742,100

Int. Cl.[2] A01N *9/36*

U.S. Cl. 424—200 **6 Claims**

1. An aqueous insecticidal concentrate composition comprising:

2–50% by weight O,O-diethyl-O-(2-isopropyl-4-methyl-pyrimidyl (6)) thiophosphate;

2–30% by weight of a surface active agent in an amount sufficient to render said O,O-diethyl-O-(2-isopropyl-4-methylpyrimidyl (6)) thiophosphate soluble in water; and

an aqueous buffer solution providing said composition with a pH ranging from 6.5 to 8.5;

said concentrate containing at least 20% by weight water.

4,107,303
ANTIHYPERTENSIVE HEXAFLUOROHYDROXYISOPROPYL BENZAZEPINES AND BENZAZOCINES

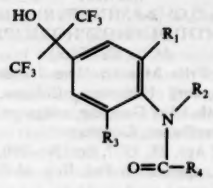
Paul Edward Aldrich, Wilmington, Del., and Gilbert Harvey Berezin, West Chester, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 24, 1976, Ser. No. 699,589

Int. Cl.[2] A61K *31/55;* **C07D** *223/16*

U.S. Cl. 424—244 **21 Claims**

1. A compound of the formula



where

R_1 and R_2 taken together = $-(CH_2)_4-$ or $-(CH_2)_5-$

where

R = methyl or ethyl;

R_3 = H, methyl, or ethyl; and

R_4 = C_1–C_5 carbons which are saturated and straight-chained, branched-chained, or alicyclic.

15. A method of treating hypertension in a mammal which comprises administering to the mammal an effective antihypertensive amount of a compound of claim **1**.

4,107,304

OXO-IMIDAZOLIDINE SUBSTITUTED CEPHALOSPORINS AND ANTIBACTERIAL COMPOSITIONS AND METHODS OF COMBATTING BACTERIA EMPLOYING THEM

Wilfried Schröck; Hans-Bodo Konig; Michael Preiss; Karl Georg Metzger, all of Wuppertal, and Michael Walkowiak, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

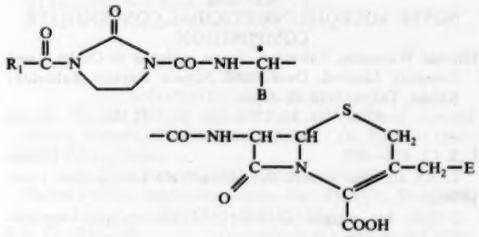
Continuation-in-part of Ser. No. 548,347, Feb. 10, 1975, abandoned. This application Jun. 27, 1975, Ser. No. 590,794

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1974, 2407715

Int. Cl.² A61K *31/545;* **C07D** *501/34, 501/24*

U.S. Cl. 424—246 **20 Claims**

1. A compound selected from the group consisting of a cephalosporin derivative of the formula:



the nontoxic salts thereof and the hydrates thereof wherein the carbon atom designated • constitutes a center of chirality;

E is hydrogen; hydroxy or acetoxy;

B is phenyl; methylphenyl; chlorophenyl; hydroxyphenyl; or cyclohexa-1,4-dien-1-yl; and

R_1 is phenyl; naphthyl; phenyl or naphthyl substituted by one to five substituents selected from the group consisting of halo, cyano, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms and alkylsulfamyl of 1 to 4 carbon atoms; thienyl; furyl; piperidyl; pyrrolidyl; $NC-CH_2-$; $NC-CH_2-CH_2$; or H_3CO-.

14. A pharmaceutical composition useful for treating bacterial infections in humans and animals which comprises an antibacterially-effective amount of a compound of claim **1** in combination with a pharmaceutically acceptable nontoxic, inert diluent or carrier.

15. A method of treating bacterial infections in humans and animals which comprises administering to such human or animal an antibacterially-effective amount of a compound of claim **1**.

4,107,305

TREATMENT OF ENDOTOXAEMIA

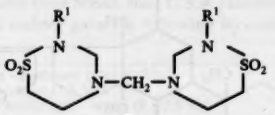
Rolf W. Pfirrmann, Lucerne, Switzerland, assignor to Ed. Geistlich Sohne A.G. fur Chemische Industrie, Lucerne, Switzerland

Filed Aug. 4, 1975, Ser. No. 601,716

Int. Cl.² A61K *31/54*

U.S. Cl. 424—246 **10 Claims**

1. A method for treating a patient suffering from endotoxaemia wherein an effective amount to reduce or eliminate endotoxaemia of a compound of the formula:



I

where R^1 is hydrogen or alkyl having 1-6 carbon atoms is administered to said patient.

4,107,306

PROCESS FOR TREATING PROLIFERATIVE SKIN DISEASE

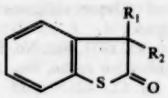
John J. Voorhees, Ann Arbor, Mich., assignor to The Regents of the University of Michigan, Ann Arbor, Mich.

Division of Ser. No. 643,633, Jan. 5, 1976, Pat. No. 4,034,087, which is a continuation-in-part of Ser. No. 425,065, Dec. 17, 1973, abandoned, which is a continuation-in-part of Ser. No. 324,012, Jan. 16, 1973, abandoned. This application Jun. 21, 1977, Ser. No. 808,447

Int. Cl.² A61K *31/535, 31/38*

U.S. Cl. 424—248.51 **2 Claims**

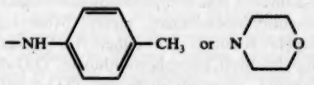
1. A process for treating proliferative skin diseases which comprises administering to the afflicted human or animal a composition containing as its active component at least one compound of the formula



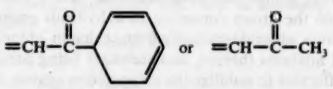
where

R_1 is hydroxy,

R_2 is



and R_1 and R_2 taken together can be



4,107,307
IMIDAZO [1,5-d]-AS-TRIAZINE-4(3H)-ONES AND THIONES

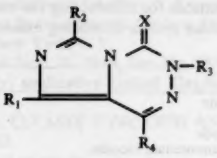
Rolf Paul, River Vale, N.J., and Judith Menschik, Tappan, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 765,318, Feb. 3, 1977, abandoned. This application Oct. 18, 1977, Ser. No. 843,174

Int. Cl.[2] **A61K** *31/53;* **C07D** *253/08, 487/04*

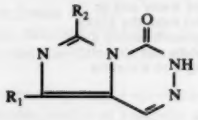
U.S. Cl. 424—249 **27 Claims**

1. A compound of the formula:

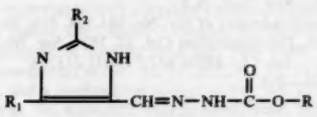


wherein X is divalent oxygen or divalent sulfur; R_1 is selected from the group consisting of hydrogen, alkyl (C_1–C_3), chloro, bromo, iodo and haloalkyl (C_1–C_3); R_2 is selected from the group consisting of hydrogen, alkyl (C_1–C_4), cycloalkyl (C_3–C_6), methoxymethyl, benzyl, naphthyl, phenyl and monosubstituted phenyl wherein said substituent is selected from the group consisting of halo, alkyl (C_1–C_4), haloalkyl (C_1–C_3) amino, dialkylamino and nitro; R_3 is selected from the group consisting of hydrogen, alkyl (C_1–C_3), alkenyl (C_3–C_4) and alkynyl (C_3–C_4); R_4 is selected from the group consisting of hydrogen and alkyl (C_1–C_3).

24. The process of preparing compounds of the formula:



wherein R_1 is hydrogen or alkyl having up to 3 carbon atoms and R_2 is hydrogen, alkyl having up to 4 carbon atoms, phenyl, benzyl, methoxymethyl or o-propoxyphenyl which comprises heating a compound of the formula:



wherein R is methyl or ethyl and R_1 and R_2 are as hereinabove defined in a non-polar high boiling organic solvent at a temperature of 175°–275° C. for a period of time sufficient for a substantial degree of ring closure to occur.

4,107,308
IMIDAZO[1,5-d]-AS-TRIAZINES

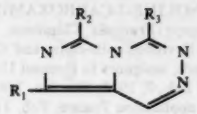
Rolf Paul, River Vale, N.J., and Judith Menschik, Tappan, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Oct. 18, 1977, Ser. No. 843,175

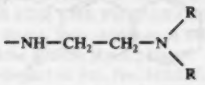
Int. Cl.[2] **C07D** *253/08, 487/04;* **A61K** *31/53*

U.S. Cl. 424—249 **18 Claims**

1. A compound selected from the group consisting of those of the formula:

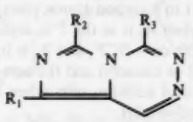


wherein R_1 is selected from the group consisting of hydrogen, alkyl having up to 4 carbon atoms, chloro and bromo; R_2 is selected from the group consisting of hydrogen, alkyl having up to 4 carbon atoms, methoxymethyl and phenyl; and R_3 is selected from the group consisting of allylthio, pyrazolylamino, piperazinyl, 4-methylpiperazinyl and moieties of the formulae: —S—R, —NH—R and

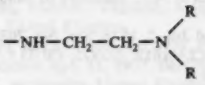


wherein R is alkyl having up to 3 carbon atoms; and the pharmacologically acceptable acid-addition salts thereof when R_3 is a basic nitrogen containing moiety.

14. The method of lowering elevated blood pressure in a mammal which comprises administering internally to said mammal an effective amount of a compound selected from the group consisting of those of the formula:



wherein R_1 is selected from the group consisting of hydrogen, alkyl having up to 4 carbon atoms, chloro and bromo; R_2 is selected from the group consisting of hydrogen, alkyl having up to 4 carbon atoms, methoxymethyl and phenyl; and R_3 is selected from the group consisting of allylthio, pyrazolylamino, piperazinyl, 4-methylpiperazinyl and moieties of the formulae: —S-R, —NH-R and



wherein R is alkyl having up to 3 carbon atoms; and the pharmacologically acceptable acid-addition salts thereof when R_3 is a basic nitrogen containing moiety.

4,107,309
SUBSTITUTED IMIDAZO[1,2-D]-AS-TRIAZINES

Rolf Paul, River Vale, N.J., and Judith Menschik, Tappan, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed May 23, 1977, Ser. No. 799,821

Int. Cl.[2] **A61K** *31/53;* **C07D** *471/04*

U.S. Cl. 424—249 **6 Claims**

1. 5-(Methylthio)-imidazo[1,2-d]-as-triazine.

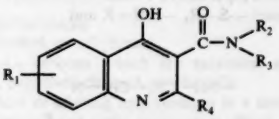
4. The method of meliorating asthma in a mammal which comprises administering internally to said mammal an effective amount of a compound selected from the group consisting of 5-(methylthio)-imidazo[1,2-d]-as-triazine, 5-(4-methyl-1-piperazinyl)-imidazo[1,2-d]-as-triazine and 5-(furfurylamino)-imidazo[1,2-d]-as-triazine.

4,107,310
QUINOLINE-3-CARBOXAMIDES

André Allais, Gagny; Francois Clémence, Rosny-sous-Bois; Roger Deraedt, Pavillons-soüs-Bois, and Odile Le Martret, Paris, all of France, assignors to Roussel Uclaf, Paris, France

Filed Feb. 7, 1977, Ser. No. 766,487
Claims priority, application France, Feb. 11, 1976, 76 03754
The portion of the term of this patent subsequent to Nov. 16, 1993, has been disclaimed.
Int. Cl.² A61K *31/47*; C07D *215/20*
U.S. Cl. 424—258 25 Claims

1. A compound selected from the group consisting of the formula



wherein R_1 is in the 5,6,7 or 8-position and is selected from the group consisting of hydrogen, halogen, $-CF_3$, $-OCF_3$, $-SCF_3$, straight chain alkyl of 1 to 4 carbon atoms, branched alkyl of 3 to 5 carbon atoms and alkoxy of 1 to 4 carbon atoms, R_2 is selected from the group consisting of hydrogen and methyl, R_3 is selected from the group consisting of 2-thiazolyl, 4,5-dihydrothiazolyl, pyridinyl, oxazolyl and 1H-imidazol-2-yl and R_4 is selected from the group consisting of hydrogen, hydroxyl, alkyl of 1 to 4 carbon atoms, phenyl and benzyl with the proviso that when R_1 is in the 7 or 8-position and is halogen, $-CF_3$, $-OCF_3$ or $-SCF_3$ and R_4 is hydrogen, R_3 is not thiazolyl, pyridinyl or oxazolyl and the non-toxic, pharmaceutically acceptable acid addition salts when R_3 is 1H-imidazol-2-yl or 4,5-dihydrothiazolyl.

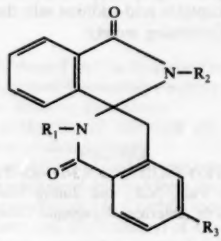
22. A method of relieving pain in warm-blooded animals comprising administering to warm-blooded animals an analgesically effective amount of at least one compound of claim 1.

4,107,311
SPIRO[ISOINDOLINE-1,3'(4'H)-ISOQUINOLINE]-1',3-DIONES

William J. Houlihan, Mt. Lakes, and Jeffrey Nadelson, Lake Parsippany, both of N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

Filed Jul. 7, 1976, Ser. No. 703,253
Int. Cl.² A61K *31/475*; C07D *471/00*
U.S. Cl. 424—258 5 Claims

1. A compound of the formula



wherein

R_1 and R_2 each independently represents straight chain lower alkyl having 1 to 4 carbon atoms and

R_3 represents hydrogen, fluoro or chloro, lower alkyl having 1 to 4 carbon atoms or lower alkoxy having 1 to 4 carbon atoms.

4. An abortifacient pharmaceutical composition comprising a compound according to claim 1 and a pharmaceutically acceptable carrier therefor.

4,107,312
DISINFECTANT FOR USE IN CLOSED-CIRCUIT TOILET FLUSHING FLUIDS

Jurgen Wegner, Düsseldorf; Klaus Bansemir, Langenfeld, and Othmar V. Ettingshausen, Düsseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf-Holthausen, Fed. Rep. of Germany

Filed Jun. 14, 1976, Ser. No. 695,456
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1975, 2526964
Int. Cl.² A01N *9/02, 9/20, 9/22, 9/24*
U.S. Cl. 424—263 5 Claims

1. A solution suitable for disinfecting the circulating fluid in a closed-circuit toilet system consisting essentially of:

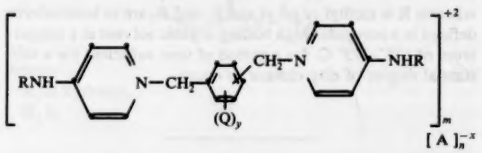
Component	Weight %
Formaldehyde	5–20
Glyoxal	0–1.5
Glutaraldehyde	2–13
Quaternary ammonium biocide, water-soluble, selected from the group consisting of benzyl trimethyl ammonium chloride, benzyl dimethyl dodecyl ammonium chloride, dichlorobenzyl dimethyl dodecyl ammonium chloride, dodecyl trimethyl ammonium chloride, dodecyl pyridinium chloride, and (p-dodecylbenzyl) trimethyl ammonium chloride	0.5–5
Inert scent	0–5
Non-ionic ethylene oxide adducts of higher fatty alcohols or alkyl phenols having 8 to 22 carbon atoms	0–5
Inert dye	0–5
Solvent selected from the group consisting of (i) water and (ii) a mixture of water and an alcohol selected from the group consisting of glycols having 2 to 4 carbon atoms and aliphatic alcohols having 1 to 4 carbon atoms	Remainder.

4,107,313
α,α-BIS-[4-(R-AMINO)-1-PYRIDINIUM]XYLENES AND ANTIBACTERIAL AND ANTIFUNGAL USES

Denis M. Bailey, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 661,128, Feb. 25, 1976, abandoned. This application Oct. 22, 1976, Ser. No. 734,729
Int. Cl.² A01N *9/22*; C07D *213/74*
U.S. Cl. 424—263 18 Claims

1. A compound having the formula



wherein:

R is hydrogen, a straight or branched-chain alkyl group containing from 1 to 18 carbon atoms, or benzyl;

Q is methyl or chlorine;

y is an integer 0 to 4;

A is an anion;

m is 1 or 3;

n is 1 or 2; and

x is 1, 2 or 3; and,

wherein (*m*) (2)=(*n*) (*x*).

17. A method for controlling bacteria and fungi on human

skin or other tissues or inanimate surfaces which comprises contacting said bacteria and fungi with an antibacterially and antifungally effective amount of a compound according to claim 1 wherein A is a pharaceutically acceptable anion when said compound is applied to human skin or other tissues.

4,107,314
ANTIFUNGAL THIO-ALKYL-IMIDAZOLE DERIVATIVES

David A. Cox, Canterbury; Geoffrey E. Gymer, Sandwich, both of England, and Braham Shroot, Cachan, France, assignors to Pfeizer Inc., New York, N.Y.

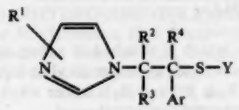
Filed Nov. 26, 1976, Ser. No. 745,305

Claims priority, application United Kingdom, Dec. 4, 1975, 49797/75

Int. Cl.[2] A61K *31/44;* C07D *409/12*

U.S. Cl. 424—263 **13 Claims**

1. A compound of the formula:



and the pharmaceutically-acceptable acid addition salts thereof wherein

R^1, R^2, R^3 and R^4 are each hydrogen or alkyl of from 1 to 6 carbon atoms;

Ar is thienyl, halothienyl, phenyl, mono- or disubstituted phenyl, said substituents being selected from halogen, lower alkyl or lower alkoxy;

and Y is pyridyl, monosubstituted or disubstituted pyridyl, wherein said substituents are selected from amino, chloro and bromo.

13. A method of treating fungal infections in animals which comprises parenterally, orally or topically administering to an animal in need of such treatment an antifungal effective amount of a compound as claimed in claim 1.

4,107,315
5-(PYRIDINYL)-2(1H)-PYRIDINONES

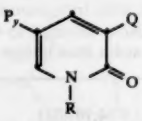
George Y. Lesher, and Chester J. Opalka, Jr., both of Schodack, N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 707,235, Jul. 21, 1976, Pat. No. 4,072,746, and a continuation-in-part of Ser. No. 621,763, Oct. 14, 1975, Pat. No. 4,004,012. This application Jul. 25, 1977, Ser. No. 818,724

Int. Cl.[2] A61K *31/44;* C07D *213/22*

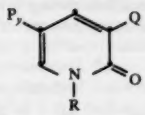
U.S. Cl. 424—263 **15 Claims**

1. A 1-R-3-Q-5-PY-2(1H)-pyridinone having the formula:



where PY is 4- or 3- or 2-pyridinyl or 4- or 3- or 2-pyridinyl having one or two lower-alkyl substituents, R is hydrogen, lower-alkyl or lower hydroxy alkyl and Q is hydrogen or halo or a pharmaceutically-acceptable acid-addition salt thereof.

7. A cardiotonic composition for increasing cardiac contractility, said composition comprising a pharmaceutically-acceptable inert carrier and, as the active component thereof, an effective amount of a cardiotonic 1-R-3-Q-5-PY-2(1H)-pyridinone having the formula



where PY is 4- or 3- or 2-pyridinyl or 4- or 3- or 2-pyridinyl having one or two lower-alkyl substituents, R is hydrogen, lower-alkyl or lower-hydroxyalkyl and Q is hydrogen, or pharmaceutically-acceptable acid-addition salt thereof.

4,107,316
FLUORURATED AMIDES OF NICOTINIC ACID AND THE PROCESS FOR THE PREPARATION THEREOF

Enrico Diamanti, Rome, Italy, assignor to SIGMA-TAU Industrie Farmaceutiche Riunite S.p.A., Italy

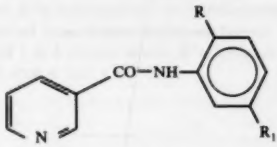
Continuation-in-part of Ser. No. 610,877, Sep. 5, 1975, abandoned. This application Mar. 8, 1977, Ser. No. 775,421

Claims priority, application Italy, Sep. 5, 1974, 52879 A/74

Int. Cl.[2] C07D *213/55;* A61K *31/44*

U.S. Cl. 424—266 **7 Claims**

1. A compound of the structural formula:



when R is $-NO_2$ or NH_2, R_1 is $-CF_3$ and;

when R is $-CF_3$, R_1 is $-NO_2$ or NH_2; and their salts with pharmacologically acceptable acids.

6. A pharmaceutical composition comprising a compound according to claim 1 in an effective amount in unit dosage form in combination with a pharmaceutically acceptable vehicle.

4,107,317
CHROMAN DERIVATIVES

Eric Alfred Watts, Harlow, England, assignor to Beecham Group Limited, United Kingdom

Division of Ser. No. 577,614, May 14, 1975, Pat. No. 4,048,317. This application Apr. 11, 1977, Ser. No. 786,139

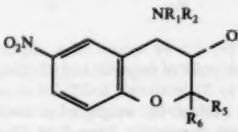
Claims priority, application United Kingdom, May 31, 1974, 24348/74

The portion of the term of this patent subsequent to Sep. 13, 1994, has been disclaimed.

Int. Cl.[2] A61K *31/445;* C07D *405/04*

U.S. Cl. 424—267 **28 Claims**

1. A pharmaceutical composition useful for effecting vasodilation in humans and animals which comprises a vasodilatory amount of a compound of the formula



(VI)

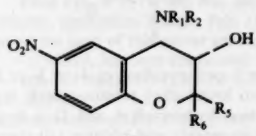
or a pharmaceutically acceptable acid addition salt thereof wherein

NR_1R_2 is a 3- to 8-membered heterocycle wherein the nitrogen atom is the only heteroatom, unsubstituted or substituted by 1 or 2 methyl groups;

R_5 is hydrogen, alkyl of 1 to 6 carbon atoms or phenyl; and

R_6 is hydrogen, alkyl of 1 to 6 carbon atoms or phenyl, in combination with a pharmaceutically acceptable carrier.

15. A method of effecting vasodilation in humans and animals which comprises administering to a human or animal in need thereof a vasodilatory amount of a compound of the formula



or a pharmaceutically acceptable acid addition salt thereof wherein

NR_1R_2 is a 3- to 8-membered heterocycle wherein the nitrogen atom is the only heteroatom, unsubstituted or substituted by 1 or 2 methyl groups;

R_5 is hydrogen, alkyl of 1 to 6 carbon atoms or phenyl; and

R_6 hydrogen, alkyl of 1 to 6 carbon atoms or phenyl, in combination with a pharmaceutically acceptable carrier.

4,107,318

FUNGICIDAL DISPERSIONS OF A SYSTEMIC FUNGICIDE

Konrad Albrecht, Fischbach, Taunus; Heinz Frensch, Frankfurt am Main, and Kurt Hartel, Hofheim, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 634,657, Nov. 24, 1975, abandoned, which is a continuation of Ser. No. 519,039, Oct. 29, 1974, abandoned. This application Apr. 11, 1977, Ser. No. 786,495

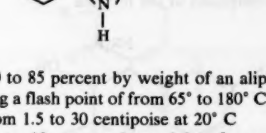
Claims priority, application Fed. Rep. of Germany, Oct. 31, 1973, 2354467

Int. Cl.[2] A01N *9/22*

U.S. Cl. 424—273 R **3 Claims**

1. A fungicidal dispersion, comprising

a. about 5 to 30 percent by weight of the compound of the formula



b. about 60 to 85 percent by weight of an aliphatic mineral oil having a flash point of from 65° to 180° C and a viscosity of from 1.5 to 30 centipoise at 20° C

c. about 6 to 15 percent by weight of a combination of dispersible agents comprising from 5 to 10 percent by weight of a monoalkylphenol polyglycol ether of 8 to 12 glycol units the monoalkyl radical of which has from 8 to 12 carbon atoms and a triisobutylphenol polyglycol ether wherein the polyglycol portion has 8 to 15 glycol units and

d. about 0.1 to 3 percent by weight of calcium monoalkylbenzene sulfonate wherein the monoalkyl radical has from 8 to 15 carbon atoms in the same.

4,107,319

PHARMACOLOGICALLY ACTIVE COMPOUNDS

Graham John Durant; Charon Robin Ganellin, both of Welwyn Garden City, and Rodney Christopher Young, Bengeo, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

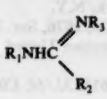
Division of Ser. No. 551,220, Feb. 19, 1975, Pat. No. 4,036,971. This application May 5, 1977, Ser. No. 794,178

Claims priority, application United Kingdom, Mar. 12, 1974, 10869/74

Int. Cl.[2] A61K *31/415*; C07D *233/64*

U.S. Cl. 424—273 R **7 Claims**

1. A compound of the formula:



wherein R_1 represents a grouping of the structure

$$Het - CH_2 - S - (CH_2)_n -$$

wherein Het is imidazole which is attached at a ring carbon and which is optionally substituted by lower alkyl or halogen; *n* is 2 or 3; R_2 is NHR_5; R_3 is R_1; and R_5 is lower alkyl, or a pharmaceutically acceptable addition salt thereof.

7. A method of blocking histamine H_2-receptors, said histamine H_2-receptors being those histamine receptors which are not blocked by mepyramine but are blocked by burimamide, which comprises administering to an animal in need of blocking of said histamine H_2-receptors in an effective amount to block said histamine H_2-receptors a compound of claim 1.

4,107,320

BIOLOGICALLY ACTIVE AMIDES

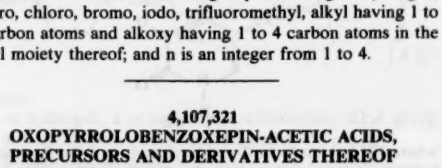
Eugene Michael Grivsky, Chapel Hill, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Aug. 6, 1976, Ser. No. 712,133

Int. Cl.[2] A61K *31/33, 31/40, 31/445*

U.S. Cl. 424—274 **10 Claims**

1. A method of treatment or prophylaxis of convulsions in a mammal susceptible to convulsions because of a previous occurrence of convulsions comprising the administration to said mammal of an anticonvulsant effective, non-toxic amount of a compound of formula (I)



wherein X is selected from the group consisting of hydrogen, fluoro, chloro, bromo, iodo, trifluoromethyl, alkyl having 1 to 4 carbon atoms and alkoxy having 1 to 4 carbon atoms in the alkyl moiety thereof; and n is an integer from 1 to 4.

4,107,321

OXOPYRROLOBENZOXEPIN-ACETIC ACIDS, PRECURSORS AND DERIVATIVES THEREOF

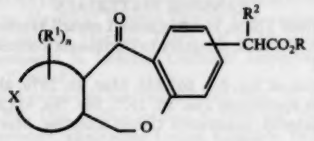
Arthur Raymond McFadden, East Brunswick, and Daniel Eugene Aultz, Middlesex, both of N.J., assignors to American Hoechst Corporation, Bridgewater, N.J.

Division of Ser. No. 607,926, Aug. 26, 1975, Pat. No. 4,025,640. This application Apr. 19, 1977, Ser. No. 788,787

Int. Cl.[2] A61K *31/415*

U.S. Cl. 424—274 **12 Claims**

1. A compound of the formula



wherein X together with the carbon atoms to which it is attached is a pyrrolo ring structure; R is hydrogen or straight or branched chain alkyl of from 1 to 5 carbon atoms; R^1 is hydrogen or alkyl of 1 to 4 carbon atoms; R^2 is hydrogen or methyl; *n* is the integer 1, 2 or 3; and salts thereof prepared from pharmaceutically acceptable bases.

4. A method of treating inflammation which comprises administering to a patient having inflammation an effective amount of a compound defined in claim **1**.

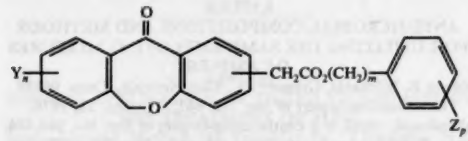
4,107,322

BENZYL AND RELATED ESTERS OF 6,11-DIHYDRODIBENZ[B,E]OXEPIN-ACETIC ACIDS

Arthur R. McFadden, East Brunswick, and Grover C. Helsley, Pottersville, both of N.J., assignors to American Hoechst Corporation, Bridgewater, N.J.

Filed Jun. 3, 1976, Ser. No. 692,361
Int. Cl.² C07D *313/12*
U.S. Cl. 424—278 **11 Claims**

1. A compound of the formula



wherein Y and Z each represent hydrogen, alkyl of from 1 to 4 carbon atoms, alkoxy of from 1 to 4 carbon atoms, halogen or trifluoromethyl and *m*, *n* and *p* each is an integer from 1 to 3.

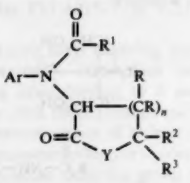
4,107,323

FUNGICIDAL 3-(N-ACYL-N-ARYLAMINO) LACTONES AND LACTAMS

David Cheong King Chan, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 631,351, Nov. 12, 1975, Pat. No. 4,012,519, which is a continuation-in-part of Ser. No. 548,660, Feb. 10, 1975, Pat. No. 3,933,860. This application Oct. 12, 1976, Ser. No. 731,491
Int. Cl.² C07D *307/32*
U.S. Cl. 424—279 **36 Claims**

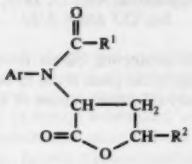
1. A method for the control of fungi which comprises contacting said fungi or their habitats with a fungicidally effective amount of a compound of the formula



wherein Ar is phenyl or phenyl substituted with 1 to 3 of the same or different substituents selected from trifluoromethyl, trichloromethyl, fluoro, chloro, bromo, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or nitro; R is hydrogen or alkyl of 1 to 6 carbon atoms; R^1 is alkyl of 1 to 6 carbon atoms, haloalkyl of 1 to 3 carbon atoms and 1 to 5 of the same or different halogen selected from fluoro, chloro or bromo, halovinyl of from 1 to 3 of the same or different halogens selected from fluoro, chloro or bromo, phenyl, or phenyl substituted with 1 to 3 of the same or different substituents selected from trifluoromethyl, trichloromethyl, fluoro, chloro, bromo, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or nitro; R^2 is hydrogen or alkyl of 1 to 6 carbon atoms; R^3 is hydrogen or alkyl of 1 to 6 carbon atoms; *n* is 1 or 2; and Y is O.

9. A fungicidal composition comprising a biologically inert carrier and a fungicially effective amount of a compound of the formula defined in claim **1**.

15. A compound of the formula



wherein Ar is phenyl or phenyl substituted with 1 to 3 of the same or different substituents selected from fluoro, chloro, bromo, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or nitro; R^1 is halovinyl of 1 to 3 of the same or different halogens selected from fluoro, chloro or bromo; R^2 is hydrogen or alkyl of 1 to 6 carbon atoms; R^3 is hydrogen or alkyl of 1 to 6 carbon atoms; and *n* is 1 or 2.

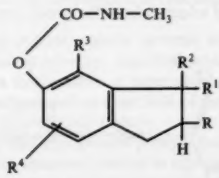
4,107,324

INDAN-5-YL-N-METHYLCARBAMIC ACID ESTERS

Detlef Grotkopp, Duesseldorf; Karlfried Wedemeyer, Cologne; Wolfgang Behrenz, Overath, and Ingeborg Hammann, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 28, 1977, Ser. No. 763,742
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1976, 2603835
Int. Cl.² C07C *125/06;* **A01N** *9/20*
U.S. Cl. 424—300 **8 Claims**

1. An indan-5-yl-N-methylcarbamic acid ester of the formula



in which

R and R^1 represent hydrogen or C_1–C_4-alkyl,

R^2 represents C_1–C_4-alkyl,

R^3 represents hydrogen or C_1–C_4-alkyl, and

R^4 represents hydrogen, chlorine, bromine, C_1–C_4 alkyl or C_1–C_4 alkoxy.

6. An arthropodicidal composition containing as active ingredient an arthropodicidally effective amount of a compound according to claim **1** in admixture with a diluent.

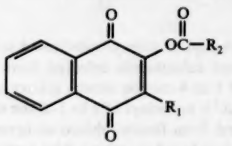
7. A method of combating arthropods which comprises applying to the arthropods, or to a habitat thereof, an arthropodicidally effective amount of a compound according to claim **1**.

4,107,325
MITICIDAL AND APHICIDAL METHOD UTILIZING 2-HIGHER ALKYL-3-HYDROXY-1,4-NAPHTHOQUINONE CARBOXYLIC ACID ESTERS

Russell Frank Bellina, and Dennis Lynn Fost, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 722,513, Sep. 13, 1976, Pat. No. 4,053,634, which is a continuation-in-part of Ser. No. 531,483, Dec. 11, 1974, abandoned, which is a continuation-in-part of Ser. No. 494,294, Aug. 2, 1974, abandoned, which is a continuation-in-part of Ser. No. 468,692, May 10, 1974, abandoned. This application Aug. 25, 1977, Ser. No. 827,598
Int. Cl.[2] A01N *9/24*
U.S. Cl. 424—301 7 Claims

1. A method for protecting plants from mites or aphids comprising applying to the plant locus to be protected a miticidally or aphicidally effective amount of a compound of the formula:



wherein

R_1 is alkyl of 8–14 carbon atoms which are branched, cyclic, or straight chain and

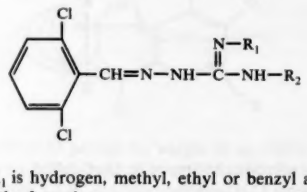
R_2 is alkoxy of 1–4 carbon atoms.

4,107,326
NOVEL BENZYLIDENEAMINOGUANIDINES

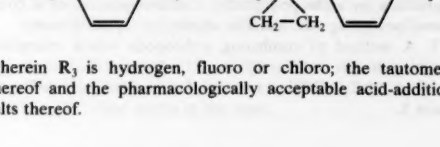
Leon Goldman; Yang-i Lin, both of Nanuet, and Joseph William Marsico, Jr., Pearl River, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed May 6, 1977, Ser. No. 794,600
Int. Cl.[2] A61K *31/155;* C07C *121/60, 133/10*
U.S. Cl. 424—304 20 Claims

1. A compound selected from the group consisting of those of the formula:



wherein R_1 is hydrogen, methyl, ethyl or benzyl and R_2 is a moiety of the formulae:



wherein R_3 is hydrogen, fluoro or chloro; the tautomers thereof and the pharmacologically acceptable acid-addition salts thereof.

4,107,327
TRANSFER MATERIALS

Edward Arthur Tilson, and Raymond Leonard Mayhew, both of Waltham, England, assignors to Caribonum Limited, London, England

Continuation of Ser. No. 667,523, Mar. 16, 1976, abandoned. This application Jun. 30, 1977, Ser. No. 811,832
Claims priority, application United Kingdom, Mar. 26, 1975, 12609/75
Int. Cl.[2] B32B *5/18*
U.S. Cl. 428—304 4 Claims

1. Transfer material comprising a base sheet including a precoat layer, a layer of porous material bonded to the precoat layer and colored ink contained within the pores of the porous material wherein the porous material comprises a mixture of cellulose acetate butyrate and medium molecular weight methyl methacrylate resins in a ratio of 6:1 to 1:1.

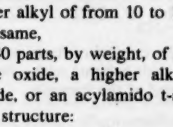
4,107,328
ANTIMICROBIAL COMPOSITIONS AND METHODS FOR UTILIZING THE SAME EMPLOYING MIXTURES OF AMINES

Edwin B. Michaels, Gregory Ct., East Norwalk, Conn. 06855

Continuation-in-part of Ser. No. 641,727, Dec. 18, 1975, abandoned, which is a continuation-in-part of Ser. No. 564,454, Apr. 2, 1975, abandoned. This application May 26, 1977, Ser. No. 800,898
Int. Cl.[2] A01N *9/20*
U.S. Cl. 424—316 16 Claims

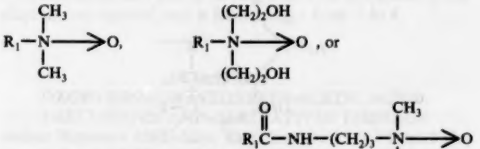
1. A broad spectrum, antimicrobial composition having low toxicity which consists of:

(a) from 0.1 to 40 parts, by weight, of a higher alkyl-N-betaine, said betaine having the structure:



where R is a higher alkyl of from 10 to 18 carbon atoms, or mixed alkyl of the same,

(b) from 0.1 to 40 parts, by weight, of a higher alkyl-N,N-dimethylamine oxide, a higher alkyl-N,N-dihydroxyethylamine oxide, or an acylamido t-amine oxide having the respective structure:



where R_1 is a higher alkyl of from 10 to 18 carbon atoms, or mixed alkyl of the same, and

(c) a protonating agent, sufficient to adjust the pH of said composition from 4.0 to 5.5.

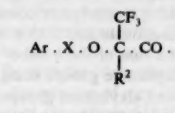
4,107,329

FLUORINATED COMPOUNDS AS THERAPEUTICS

David Bryan Haydock; Thomas Patrick Cunningham Mulholland, and Jeffrey Meyrick Thorp, all of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 630,685, Nov. 10, 1975, Pat. No. 4,055,595. This application Jun. 6, 1977, Ser. No. 803,937
Claims priority, application United Kingdom, Dec. 6, 1974, 52829/74
Int. Cl.[2] A61K *31/19, 31/22, 31/235*
U.S. Cl. 424—317 11 Claims

10. A method of producing an anti-arthritic effect in a warm blooded animal requiring such treatment which comprises orally administering to the said animal a therapeutically effective amount of a compound of the formula:



I

wherein Ar is a phenyl radical substituted in the 4-position by a halophenyl radical, or Ar is a naphthyl radical optionally substituted by a halogen atom; X is $—CH_2—$; R^1 is a hydroxy radical or an alkoxy radical of 1–6 carbon atoms; and R^2 is a methyl radical or a trifluoromethyl radical; or for a compound wherein R^1 is a hydroxy radical, a pharmaceutically acceptable base addition salt thereof.

4,107,330

TOPICAL APPLICATION OF THIOGLYCOLIC ACID IN THE TREATMENT OF ACNE

Aaron Leonard Sheffner, 18 Trombley Dr., Livingston, N.J. 07039

Filed Apr. 4, 1969, Ser. No. 813,750
Int. Cl.[2] A61K *31/19*
U.S. Cl. 424—317 8 Claims

1. A process for treating acne comprising:

(1) applying to the acne affected skin of a person suffering therefrom, an acne alleviating amount of a topical composition containing 0.1% to 10% by weight of thioglycolic acid or a pharmaceutically acceptable salt thereof, and

(2) keeping said composition in contact with the affected skin for several hours.

4,107,331

ZINC CHELATING FUNGICIDAL COMPOSITION

Max Rosenberg, 1721 Nashville Ave., New Orleans, La. 70115

Filed Mar. 5, 1976, Ser. No. 664,361
Int. Cl.[2] A01N *9/20, 9/22*
U.S. Cl. 424—319 22 Claims

1. A process of killing fungi requiring zinc ions to carry out the process of secondary metabolism necessary for their growth comprising administering to a mammal having an infection caused by such fungi a compound capable of chelating zinc ions in a concentration of at least 3.5% and a pH of about 4.5 to 10 in an amount effective to control said fungi, said compound being selected from the group consisting of nontoxic water soluble salts of ethylenediaminetetraacetic acid, diethylenetriaminepentaacetic acid, 1,2-diaminocyclohexane-N,N'-tetraacetic acid, β-mercaptoethyliminodiacetic acid, tetrakis (2-aminoethyl)-ethylenediamine, B,B',B''-triaminotriethylamine, N-hydroxyethylethylenediaminetriacetic acid and ethylenediamine N,N-dipropionic acid N,N'-diacetic acid.

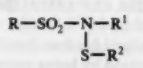
4,107,332

MITE AND MITE-OVICIDAL COMPOSITIONS

David C. K. Chan, Petaluma, and Arthur A. Whipp, Walnut Creek, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Jan. 17, 1977, Ser. No. 760,042
Int. Cl.[2] A01N *9/16*
U.S. Cl. 424—321 11 Claims

1. A method for the killing of mite eggs which comprises applying thereto an ovicidally effective amount of a compound of the formula



wherein R and R^1 individually are cycloaklyl of 5 to 8 carbon atoms substituted with up to 2 alkyl groups of 1 to 4 carbon atoms, alkyl of 1 to 6 carbon atoms, alkenyl of 3 to 6 carbon atoms, and phenyl or benzyl substituted with up to 2 of the same or different substituents selected from the group consisting of fluoro, chloro, bromo, trifluoromethyl, trichloromethyl, tribromomethyl and alkyl of 1 to 2 carbon atoms and R^2 is tetrachloroethyl, with the proviso that R and R^1 are not both cycloalkyl or aryl.

4,107,333

SKIN CARE WITH A COSMETIC COMPOSITION CONTAINING OLEYL ACETATE

Bernard Hercelin, Clermont, and Jean-François Hamon, Saint-Quen l'Aumone, both of France, assignors to Laboratories Cassenne, Paris, France

Filed Mar. 22, 1976, Ser. No. 669,026
Claims priority, application France, Mar. 26, 1975, 75 09438
Int. Cl.[2] A61K *7/48*
U.S. Cl. 424—365 3 Claims

1. A process for the care of the skin which comprises applying a cosmetic composition for skin care containing an effective amount of oleyl acetate and a carrier to the skin in an amount effective care of the skin.

4,107,334

MODIFIED PROTEIN

Ramesh C. Jolly, Waterford, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Oct. 13, 1976, Ser. No. 732,018
Int. Cl.[2] A23J *3/00*
U.S. Cl. 426—7 11 Claims

1. A process for the preparation of functional protein, which comprises:

(a) subjecting impure natural protein selected from the group consisting of whey, microbial protein and vegetable protein to a temperature of from about 40° to 150° C in aqueous medium until at least 50% of the ultimate protein capable of precipitation occurs;

(b) separating said precipitated protein from said medium;

(c) treating said separated protein in aqueous medium with a proteolytic enzyme at a temperature of from about 20° to 65° C for a period of up to 30 minutes until solution occurs; and

(d) deactivating said enzyme, said enzyme being employed at a level, per gram of said separated protein on a dry basis, of at least about

240 HUT where said enzyme is a microbial acid protease,

300 PC where said enzyme is a microbial neutral protease,

2300 Delf Units where said enzyme is a microbial alkaline protease,

130,000 N.F. PU where said enzyme is a plant protease, and

150 Pepsin Units where said enzyme is an animal protease,

said impure protein being such that in in an aqueous medium a solution or suspension is formed and said suspen-

sion must be such that a hazy or clear solution results from said proteolytic hydrolysis.

4,107,335

FREEZE-DRIED MIX FOR SPOONABLE SALAD DRESSING AND METHOD THEREFOR

Myer Glickstein; Justin M. Tuomy, both of Framingham, and Marianne J. Shwert, Natick, all of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 8, 1977, Ser. No. 785,804

Int. Cl.[2] A23L *1/24*

U.S. Cl. 426—96 **4 Claims**

1. A method of preparing a free-flowing, dry salad dressing mix which is characterized by being reconstituted into a spoonable salad dressing by the mixing of water therewith, which comprises preparing a mixture for subjection to freeze-drying, said mixture comprising the following composition prior to freeze drying thereof:

Ingredient	Percent of mixture
Salad oil (vegetable type)	20.0 – 40.6
Microcrystalline cellulose powder, (CMC-modified)	0.14 – 0.16
Pregelatinized starch	4.8 – 7.9
Unmodified food starch	1.0 – 3.1
Egg yolk solids	4.9 – 7.1
Dry synthetic vinegar	1.9 – 2.1
Hot water-soluble gum	0.3 – 0.6
Sugar	9.9 – 10.1
Salt	1.9 – 2.1
Dry powdery spice	0.9 – 1.1
Non-ionic surface-active agent	0.14 – 0.19
Water	33.5 – 45.5

by the steps of:

a. mixing said pregelatinized starch and said unmodified food starch to form a dry blend,
b. mixing about 80 to about 90 percent of said water with said dry blend to form a slurry,
c. cooking said slurry at about 85° C. to 88° C. for about 10 to about 15 minutes until said slurry is converted to a translucent mass,
d. restoring the quantity of water lost by evaporation during said cooking while thoroughly mixing said translucent mass,
e. dividing the remaining about 10 to about 20 percent of said water into two equal remaining water portions,
f. mixing said microcrystalline cellulose powder with one of said remaining water portions to form a paste,
g. mixing said hot water-soluble gum with the other of said remaining water portions to form a suspension of said gum,
h. heating said suspension of said gum for about 10 minutes at about 100° C. to form an aqueous solution of said gum,
i. mixing said sugar, said salt, said egg yolk solids, and said dry, powdery spice,
j. mixing said microcrystalline cellulose paste, said aqueous solution of said gum, said mixture of said sugar, said salt, said egg yolk solids, and said dry, powdery spice with said translucent mass at about 85° C. to about 88° C. in a vertical cutter mixer for about 2 minutes at low speed, then for an additional mixing period of 2 – 3 minutes at high speed while slowly adding a dispersion of said non-ionic surface-active agent in said vegetable salad oil to form a salad dressing,
k. spreading said salad dressing to a substantially uniform depth of about 1 to 1.5 cm on freeze drying trays,
l. blast freezing said salad dressing on said freeze drying trays for about 3 to about 4 hours,
m. freeze-drying said salad dressing for about 20 to about 24 hours until the moisture content of the salad dressing is reduced to not more than 2%,
n. grinding the freeze-dried salad dressing at slow speed to form a coarsely ground, freeze-dried salad dressing, and
o. thoroughly mixing said dry, synthetic vinegar with said coarsely ground, freeze-dried salad dressing to produce said free-flowing, dry salad dressing mix.

4,107,336

EDIBLES CONTAINING COLORANTS HAVING ETHYLSULFONATE-ALKYLAMINE BACKBONES

Kenneth Melvin Otteson, San Bruno, and Daniel Joseph Dawson, Los Altos, both of Calif., assignors to Dynapol, Palo Alto, Calif.

Division of Ser. No. 638,731, Dec. 8, 1975. This application Sep. 20, 1977, Ser. No. 835,086

Int. Cl.[2] A23L *1/27, 1/275*

U.S. Cl. 426—250 **10 Claims**

1. A colored edible material comprising an edible material having admixed therewith an effective coloring amount in the range of from 10 ppm by weight to 1% by weight of a polymeric colorant itself comprising a copolymer consisting essentially of a plurality of ethylsulfonate and 2 to 6 carbon atom lower alkylamine groups, the sum of the number of ethylsulfonate groups and lower alkylamine groups being from 20 to 8000 and the number of lower alkylamine groups being from 0.4 to 2.5 times the number of ethylsulfonate groups, having a plurality of chromophoric group units covalently bonded thereto through said lower alkylamine groups.

4,107,337

SAUSAGE PRODUCT SIMULATING BACON AND METHOD OF MAKING

Frederick W. Deppner, Jr., Overland Park, Kans., assignor to Western Dairy Products Division of Chelsea Industries, Inc., San Francisco, Calif.

Filed May 28, 1976, Ser. No. 690,860

Int. Cl.[2] A23L *1/31*

U.S. Cl. 426—266 **2 Claims**

1. A method for making a product simulating bacon which is sliceable without crumbling comprising curing pork belly robbins, lean pork and a member of the group consisting of bacon ends and slices and smoked pork jowls sliced, fine-grinding a portion of the cured mixture and forming an emulsion therewith of water and a binder selected from the group consisting of calcium reduced dried skim milk, sodium caseinate, calcium caseinate, high-fat caseinate, isolated soya protein and soya protein concentrate, mixing said emulsion with the remainder of said cured mixture transferring the resulting mixture to containers, and cooking the same.

4,107,338

BATTER MIX CONTAINING FLOURY STARCH OF FL_2FL_2 CONSTITUTION

Gerald L. Tutor, Sappington, Mo.; James C. Fruin, Green Valley, Ariz., and Jo[illegible] L. Helm, Laurinburg, N.C., assignors to Anheuser-Busch, Incorporated, St. Louis, Mo.

Filed Nov 5, 1976, Ser. No. 739,209

Int. Cl.[2] A23L *1/176;* A21D *10/00*

U.S. Cl. 426—293 **20 Claims**

1. Batter mix comprising floury starch derived from a plant of the genetic constitution fl_1fl_1, and translocations, inversions, mutants, and variants thereof, and water.

4,107,339

SOLUBLE COFFEE PROCESS AND PRODUCT

Brian Clifford Shrimpton, Chipping Warden, England, assignor to General Foods Limited, Banbury, England

Filed Jul. 26, 1977, Ser. No. 819,088

Claims priority, application United Kingdom, Jul. 29, 1976, 31711/76

Int. Cl.[2] A23F *1/08*

U.S. Cl. 426—387 **6 Claims**

1. In a process for the preparation of soluble coffee powder

obtained by dehydrating an aqueous roasted and ground coffee extract, the improvements which comprise;

a. evaporatively stripping the volatile flavourful components from the aqueous coffee extract in an evaporation zone at an absolute pressure ranging from 16 inches mercury to atmospheric pressure and vaporizing 5 to 15% of the water in the aqueous coffee extract, said water vapour containing the stripped flavourful coffee components;

b. partially condensing the stripped volatile flavourful components-containing water vapour mixture in a condensing zone at an absolute pressure ranging from 16 inches mercury to atmospheric pressure, the condensate as it exits from the condensing zone is within a temperature range from 33° F to 70° F to recover an aqueous solution of condensed flavourful and aroma component;

c. concentrating the stripped aqueous coffee extract from step (a) to form a concentrated coffee extract having a solids content ranging from 37% to 55% (w/w);

d. admixing the aqueous solution of flavourful components of step (b) with the concentrated coffee extract of step (c);

e. feeding the mixture of step (d) to a spray dryer within a temperature range from 27° F to 200° F;

f. spray drying the mixture of step (e) at a droplet size of between 100 and 300 microns using a spray drying nozzle pressure of from 700 to 2500 psig, an inlet air temperature of between 250° F and 550° F and an outlet air temperature of between 180° F and 230° F.

4,107,340

METHOD OF REMOVING CORN FROM THE COB

George H. Robertson; Melvin E. Lazar, both of Berkeley; John M. Krochta, El Cerrito; Daniel F. Farkas, Piedmont, and John L. Bomben, Mill Valley, all of Calif., assignors to The United States of America, as represented by the Secretary of Agriculture, Washingon, D.C.

Continuation of Ser. No. 680,643, Apr. 27, 1976, abandoned. This application Jul. 21, 1977, Ser. No. 817,889

Int. Cl.[2] A23L *1/212*

U.S. Cl. 426—481 **3 Claims**

1. A method of removing whole kernels of corn from the cob, which consists of

(a) longitudinally splitting the cob without damage to the whole kernels, and

(b) applying a force to the kernels sufficient to separate whole kernels intact from the split cob, said force being applied to individual rows of kernels of corn commencing with the row adjacent the split and advancing to adjacent rows as the kernels are separated from the cob.

4,107,341

METHOD WITH AN IMPROVED MIXING CYCLE FOR PREPARING DOUGH

Samuel O. Seiling, Richmond, Va., assignor to AMF Incorporated, White Plains, N.Y.

Continuation-in-part of Ser. No. 595,469, Jul. 14, 1975, abandoned. This application Nov. 22, 1976, Ser. No. 743,450

Int. Cl.[2] A21D *8/02*

U.S. Cl. 426—504 **5 Claims**

1. A method of preparing dough, comprising the discrete sequential steps of:

introducing raw dough ingredients into a mechanical mixer;

initiating the mixing cycle by mixing the ingredients for a first time interval at a mixing speed sufficient for preliminary blending of the ingredients;

increasing the mixing speed for a second time interval sufficient to develop the blended ingredients into a cohesive mass; and

terminating the mixing cycle by reducing the mixing speed for a third time interval for final development of the dough, the reduced mixing speed being greater than the mixing speed during the first time interval.

4,107,342

FLAVORING WITH 1,7-DIHYDROXY-2,5-DITHIA-TRICYCLO[7.3.0.0^{3,7}]DODECANE

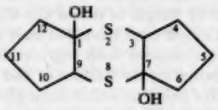
Michael J. Greenberg, Chicago, Ill., assignor to The Quaker Oats Company, Chicago, Ill.

Division of Ser. No. 769,520, Feb. 17, 1977. This application Sep. 26, 1977, Ser. No. 836,775

Int. Cl.[2] A23L *1/231*

U.S. Cl. 426—535 **7 Claims**

1. A process for altering the flavor of a foodstuff comprising adding to the foodstuff an amount of a flavorant 1,7-dihydroxy-2,8-dithia-tricyclo[7.3.0.0^{3,7}]dodecane effective to impart a meat flavor and represented by the formula:



4,107,343

WHIPPABLE EMULSION STABLE AT ROOM TEMPERATURE

Anthony V. Petricca, Cleveland, Ohio, assignor to SCM Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 739,511, Nov. 8, 1976, abandoned, which is a continuation of Ser. No. 589,497, Jun. 23, 1975, abandoned. This application Nov. 23, 1977, Ser. No. 854,088

Int. Cl.[2] A23G *3/00*

U.S. Cl. 426—564 **8 Claims**

1. A pourable, edible, homogenized emulsion consisting essentially of about 45 to 60% water, about 20 to 30% fat, about 7 to 20% sweetener, about 0.5 to 2.5% dispersible protein, about 0.1 to 0.75% thickener, about 0.1 to 1.0% buffer and about 0.75 to 2.5% emulsifier, said emulsifier consisting essentially of a major proportion of propylene glycol monostearate or hexaglycerol distearate in the range of about 0.5 to 1.5% and a minor proportion of a combination of ethoxylated sorbitan ester in the range of about 0.3 to 0.6%, sorbitan monostearate in the range of about 0.05 to 0.25% and lecithin in the range of about 0 to 0.15%, said emulsion being substantially stable against separation and/or gelation for at least about one year at room temperature under aseptic conditions and whippable in the temperature range from about 40° to 100° F. to at least about 200% overrun.

4,107,344

METHOD OF PRODUCING DEHYDRATED RICE FLAKES

George H. Beston, Cobourg, and Donald W. Kirk, Toronto, both of Canada, assignors to General Foods Limited, Toronto, Canada

Filed May 26, 1976, Ser. No. 690,138

Claims priority, application Canada, May 26, 1975, 227742

Int. Cl.[2] A23L *1/18, 1/168*

U.S. Cl. 426—625 **7 Claims**

1. A method of preparing rice flakes which comprises drum drying an aqueous slurry of an admixture of about 70% to about 90% by weight of finely subdivided substantially completely gelatinized rice grains and about 10% to about 30% by weight of finely subdivided uncooked rice grains, and subdividing the drum dried sheet of dehydrated rice material into flakes.

4,107,345

PARTICULATE DEHYDRATED POTATOES WITH MONO- AND ETHOXYLATED GLYCERIDES

Ira A. MacDonald, Prior Lake, Minn., and Richard R. Egan, Worthington, Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Jun. 23, 1971, Ser. No. 156,120
Int. Cl.[2] A23L *1/12*
U.S. Cl. 426—637 **12 Claims**

1. In the process of preparing particulate dehydrated potatoes wherein potatoes are cooked and dried, the improvement which comprises incorporating first and second intentional food additives into said potatoes before drying, said first additive consisting essentially of the condensation product of from 10 to 95 parts by weight ethylene oxide with correspondingly from 90 to 5 parts by weight of mixed C_{10}–C_{24} fatty acid ester of glycerine, said mixed ester having at least a 10 weight percent monoglyceride content with diglycerides, triglycerides and glycerine constituting the balance of said mixed ester and said second additive being an edible monoglyceride.

4,107,346

DIETARY SALT COMPOSITIONS

Hilard L. Kravitz, 402 Doheny Rd., Beverly Hills, Calif. 90211

Filed Sep. 2, 1976, Ser. No. 719,913
Int. Cl.[2] A23L *1/237*
U.S. Cl. 426—648 **12 Claims**

1. A dietary salt composition for use as a replacement for salt in foods and as a dietary supplement which comprises a base formulation of the essential mineral element cations, sodium, potassium, calcium and magnesium in the form of physiologically acceptable compounds thereof in the proportions corresponding substantially to the proportions of these elements in the extra-cellular fluids of the human body, said proportions based on the cations comprising about 92–93.1% sodium, 2.4–3.4% potassium, 3.1–3.4% calcium and 1.2–1.4% magnesium, said base formulation acting as a carrier and having intimately associated therewith at least one of the trace elements known to be essential in the human diet, said trace elements being incorporated in proportions to supply at least about 20% of the recommended daily allowance of said trace elements as set by the National Academy of Sciences for each 10 gram portion of the salt composition.

4,107,347

METHOD OF MANUFACTURING A MILK CHOCOLATE

Victor George Burley, Tasmania, Australia, assignor to Cadbury Limited, Birmingham, England

Filed Aug. 16, 1974, Ser. No. 498,137
Claims priority, application United Kingdom, Aug. 17, 1973, 38960/73
Int. Cl.[2] A23G *1/00*
U.S. Cl. 426—660 **7 Claims**

1. A method of manufacturing a milk chocolate, comprising the steps of heating a solution consisting essentially of sugar and water to a temperature of between 250° F and 320° F, mixing the resultant heated sugar solution with a material selected from the group consisting of milk powder, milk powder and anhydrous butter fat, milk powder and cocoa mass and milk powder with cocoa powder and butter fat while the heated sugar solution is at a temperature of between 250° F and 320° F and by using a greater weight of sugar than milk powder, and processing the resultant mixture with other chocolate making ingredients to form a milk chocolate.

7. A method of manufacturing a milk chocolate, comprising the steps of heating a solution consisting essentially of sugar and water to a temperature of between 250° F and 320° F, substantially immediately mixing the resultant heated sugar solution with a material including milk powder while the heated sugar solution is at a temperature of between 250° F and 320° F and by using a greater weight of sugar than milk powder, and processing the resultant mixture with other chocolate making ingredients to form a milk chocolate.

4,107,348

METHOD OF CONSTRUCTING PORCELAIN-METAL DENTAL RESTORATIONS

Leo Hirschhorn, 4200 Hillcrest Dr., Hollywood, Fla. 33021

Filed Jan. 19, 1977, Ser. No. 760,634
Int. Cl.[2] A61C *5/10, 13/02*
U.S. Cl. 427—2 **4 Claims**

1. In the method of forming dental restorations including prosethetic teeth having a metallic base, there being at least one particulate opaque ceramic coating applied to said base, and at least one transluscent ceramic coating applied to said opaque coating, the improved step of applying said opaque coating in conjunction with a resinous binder in a volatile vehicle, which upon evaporation of said vehicle binds the particles of said opaque coating to said metallic base in the absence of a separate baking operation.

4,107,349

METHOD OF ADJUSTING THE FREQUENCY OF PIEZOELECTRIC RESONATORS

John R. Vig, Monmouth County, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 12, 1977, Ser. No. 824,185
Int. Cl.[2] B05D *3/06*; D05D *5/12*
U.S. Cl. 427—36 **26 Claims**

1. Method of adjusting the frequencies of a piezoelectric resonator prior to sealing the resonator into an enclosure, said method including the steps of

(A) placing the resonator into an enclosure;

(B) backfilling the enclosure with a polymerizable gas;

(C) polymerizing the polymerizable gas with radiation until an amount of polymer is formed on the resonator that causes the frequencies of the resonator to be adjusted to the desired frequencies; and

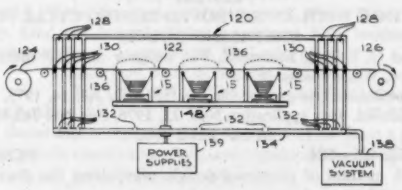
(D) sealing the enclosure.

4,107,350

METHOD FOR DEPOSITING FILM ON A SUBSTRATE

Joseph E. Berg, Box 3939 Terminal Annex, Los Angeles, Calif. 90051, and Randolph E. Brown, Jr., 14487 Edgeridge Dr., Hacienda Hts., Calif. 95431

Division of Ser. No. 280,489, Aug. 14, 1972, Pat. No. 3,913,520.
This application Apr. 24, 1975, Ser. No. 571,480
Int. Cl.[2] B05D *3/06*
U.S. Cl. 427—38 **17 Claims**



1. The method of depositing and implanting a film on a substrate within an airtight enclosure comprising the steps of:

exhausting the atmosphere from said enclosure to maintain a high vacuum:

emitting ionized molecular particles from a source of material to be deposited;

directing the molecular particles to a region adjacent a plurality of electrodes shaped to develop field emission of charged particles;

applying potentials to said shaped electrodes to establish

electric fields sufficient to cause the electrodes to emit charged particles into said region for further ionizing said molecular particles after emission from said source of material; and

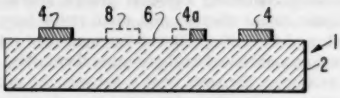
accelerating and directing the ionized molecular particles to a specimen remote from said source material with sufficient energy to implant a film of said molecular particles on said specimen to a selected depth of penetration and thickness.

4,107,351

METHOD OF DEPOSITING OR REPAIRING A PATTERNED METAL LAYER ON A SUBSTRATE

Edward Anthony James, Manville, and Philip Kuznetzoff, Somerville, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 15, 1976, Ser. No. 732,782
Int. Cl.[2] C23F *1/02, 17/00*
U.S. Cl. 427—43 **9 Claims**



1. A method of electrolessly plating a patterned metal layer on an insulating substrate which comprises:

(a) sensitizing and activating said substrate,

(b) coating said substrate with a photoresist,

(c) exposing said photoresist through a mask,

(d) developing said exposed photoresist with a developer solution to form a pattern exposing portions of said substrate, said developer solution containing an effective amount of an activator, and

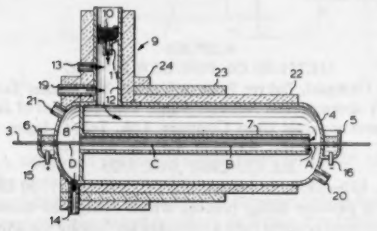
(e) immersing said substrate into an electroless plating solution whereby a pattern of metal is deposited onto said exposed portions of said substrate.

4,107,352

CHEMICAL VAPOR DEPOSITION

Mohammad Javid Hakim, Burlington, Canada, assignor to Westinghouse Canada Limited, Hamilton, Canada

Filed Oct. 20, 1977, Ser. No. 843,869
Claims priority, application Canada, Jan. 13, 1977, 269628
Int. Cl.[2] B05D *3/14*; C23C *11/00, 13/00*
U.S. Cl. 427—50 **6 Claims**



1. A method of producing a coating of metallic composition on an elongated conductive substrate by means of chemical vapor deposition wherein the substrate is heated to a predetermined temperature by passing an electric current longitudinally therethrough and exposed to a gaseous mixture of reactant materials suitable to produce said metallic composition at said predetermined temperature characterized in that gaseous material is added to said gaseous mixture to maximize the Prandtl number and minimize the Schmidt number of said gaseous mixture in the vicinity of said substrate and at said predetermined temperature.

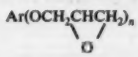
4,107,353

METHOD FOR PHOTOPOLYMERIZATION OF PIGMENTED EPOXIDE COMPOSITIONS

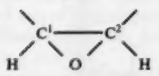
Gabriel Karoly, Springfield, N.J., and John L. Gardon, Birmingham, Mich., assignors to American Can Company, Greenwich, Conn.

Continuation-in-part of Ser. No. 436,479, Jan. 25, 1974, abandoned, which is a division of Ser. No. 228,317, Feb. 22, 1972, abandoned. This application Mar. 4, 1976, Ser. No. 663,919
Int. Cl.[2] B05C *5/00, 17/04*
U.S. Cl. 427—54 **7 Claims**

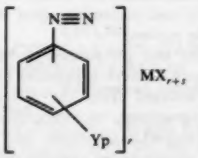
1. In an improved method for preparing pigmented epoxide coatings exhibiting satisfactory adhesion and containing pigment in an amount ranging from that amount sufficient to impart an acceptable level of hiding of the substrate up to about 60% by weight by polymerization of a liquid epoxide-containing composition that incorporates a latent polymerization catalyst and which contains at most insignificant amounts of unreactive liquid components, wherein (a) said composition contains at least one epoxide selected from the group consisting of those exhibiting the general formula



and low molecular weight telomers thereof and compounds containing at least two divalent radicals of the formula



wherein Ar represents an aryl or alkaryl hydrocarbon radical, *n* is the integer 2 or 3 and C^1 and C^2 form part of a five-or six-membered carboxylic ring structure, said epoxide comprising at least a major portion of the epoxides present in said liquid epoxide-containing composition; and (b) said composition contains between 0.25 and 5%, based on the total weight of said composition, of a latent catalyst selected from aryl diazonium compounds exhibiting the general formula



wherein X represents a halogen radical and M represents an element selected from the group consisting of arsenic, bismuth, boron, iron, phosphorus and tin; Y is selected from at least one of the groups consisting of nitro, hydroxyl, halogen, N-morpholino, alkyl, alkoxy, aryl, amino, arylamino, alkylamino and arylmercapto radicals, *r* is an integer equal to the absolute value of the charge on the complex anion MX_{n+s}, *s* is an integer equal to the valence state of M, and *p* is an integer between 1 and 5, inclusive; the improvements that comprise incorporating into said liquid epoxide-containing composition at least one carboxylic acid anhydride selected from the group consisting of liquid anhydrides of polycarboxylic acids and liquid mixtures containing two or more anhydrides of polycarboxylic acids, with the proviso that the composition contains at least 1.8 equivalent weights of epoxide per equivalent weight of said acid anhydride, applying the resultant liquid epoxide-containing composition to a substrate and exposing the resultant liquid

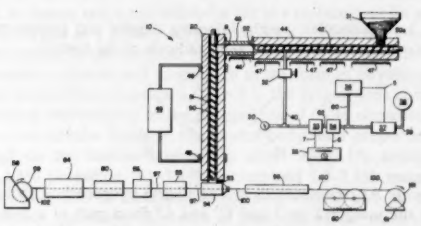
coating to ultraviolet radiation for a period of time sufficient to decompose the latent catalyst and convert said coating to a dry solid material.

4,107,354

COATING ELECTRICALLY CONDUCTIVE WIRE WITH POLYOLEFIN

Frederic Nash Wilkenloh, Conover; Paul Alan Wilson, Hickory, and Steve Allen Fox, Taylorsville, all of N.C., assignors to Comm/Scope Company, Catawba, N.C.

Division of Ser. No. 584,164, Jun. 5, 1975, abandoned. This application Mar. 29, 1977, Ser. No. 782,361
Int. Cl.[2] B29D *27/00*
U.S. Cl. 427—118 **9 Claims**



1. A method of covering an electrically conductive wire with a polyolefin comprising:

(a) mixing a polyolefin with a nucleating agent to form a mixture;

(b) pressurizing above atmospheric pressure and heating said mixture to a temperature below that of the decomposition temperature of said nucleating agent sufficient to render said polyolefin molten;

(c) injecting into said pressurized molten polyolefin and nucleating agent mixture a physical blowing agent in a liquid state selected from the group comprising dichlorotetrafluoroethane, trichlorotrifluorethane and mixtures of trichlorofluoromethane and dichlorodifluoromethane and mixing under pressure the blowing agent in its liquid state with said pressurized and heated mixture of polyolefin and nucleating agent, said liquid blowing agent being convertible to a gas upon exposure to atmospheric pressure;

(d) cooling the mixture described in step (c) above to a predetermined temperature below that achieved in step (b) but above the solidification temperature of said mixture;

(e) coating the thus cooled mixture of step (d) onto a coating of unfoamed polyolefin on a wire and adhesively bonding it thereto;

(f) exposing the coated wire of step (e) to atmospheric pressure and temperatures below that achieved by step (d) for autogenously converting said blowing agent into a gas to expand said polyolefin by creating a multiplicity of cells wherein said gas is entrapped thereat, and solidifying the thusly expanded mixture.

4,107,355

PROCESS FOR THE PRODUCTION OF HIGHLY HEAT-RESISTANT INSULATING COATINGS ON ELECTRICAL CONDUCTORS

Suresh Merchant; Diethard Winkler, both of Wuppertal, and Marita Bluhm, Schwelm, all of Fed. Rep. of Germany, assignors to Dr. Kurt Herberts & Co. Gesellschaft Mit Mit Beschrankter Haftung Vorm. Otto Louis Becker, Wuppertal, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 779,001, Mar. 18, 1977, abandoned. This application Jun. 29, 1977, Ser. No. 811,383
Claims priority, application Austria, Mar. 25, 1976, 2202/76
Int. Cl.[2] C08K *5/06;* **B05D** *5/12, 7/20*
U.S. Cl. 427—120 **14 Claims**

1. A process for the production of highly heat resistant insulating coatings on electrical conductor wires which comprises:

(a) coating the electrical conductor wire with a solution comprising a physiologically acceptable organic solvent and 30 to 90% by weight of an amide and/or imide-modified ester resin of polyhydric alcohols, polybasic carboxylic acids containing carboxyl groups attached to the aromatic rings, wherein said ester resins have an acid number of from 10 to 50 and the equivalent ratio of hydroxyl groups to carboxyl groups in the starting products for producing the ester resin is between 1.6 and 2.5, the solution contains aliphatic amines in such a quantity that there are from 0.5 to 1.5 amino groups for every free carboxyl group in the ester resin, and at least about 70% by weight of the total solvent consists of monoalkyl ethers and/or dialkyl ethers of mono- and/or dialkane diols containing from 2 to 4 carbon atoms per alkane moity, the alkyl moities of said dialkyl ethers each containing 1 to 6 carbon atoms; and

(b) heating said coated conductor wire to a temperature of 150°–400° C.

10. A stoving lacquer comprising a physiological acceptable organic solvent and 30 to 90% by weight of a thermosetting amide and/or imide-modified ester resins of polyhydric alcohols, polybasic carboxylic acids containing carboxylic groups attached to aromatic rings, wherein the ester resins have an acid number of from 10 to 50 and the equivalent ratio of hydroxyl groups to carboxyl groups in the starting products for producing the ester resins amounts to between 1.6 and 2.5, the solution contains aliphatic amines in such a quantity that there are from 0.5 to 1.5 amino groups for every free carboxyl group in the ester resin, and at least about 70% by weight of the total solvent consists of mono- and/or di-alkyl ethers of mono- and/or di-alkane diols containing from 2 to 4 carbon atoms per alkane moiety, the alkyl moieties of said ethers each containing 1-6 carbon atoms.

4,107,356

METHOD OF POWDER LINING

Hiroshi Ukihashi, Tokyo; Tetsuya Uchino, Yokohama; Takeshi Abe, Yokohama, and Nobuaki Kunii, Yokohama, all of Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

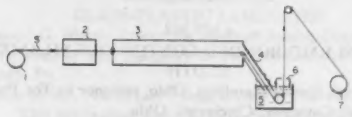
Filed Oct. 15, 1975, Ser. No. 622,456
Int. Cl.[2] C08K *3/04, 7/06*
U.S. Cl. 427—195 **10 Claims**

1. In a powder lining process which comprises coating a synthetic resin powder onto a substrate and baking the adhered powder and substrate the improvement which comprises, coating onto said substrate a fluorine-containing melt processable synthetic resin powder having a bulk density of 0.1 to 1.2 gms/cm^3 and an average particle diameter of 2–400 microns which contains carbon fibers having a length of less than 1000 microns, a diameter of 5–30 microns and a length to diameter ratio of 2–100 wherein the content of carbon fiber in the total mixture of synthetic resin powder and carbon fiber is from 2 to 50 wt.%.

4,107,357
METHOD FOR EFFECTING ONE SIDE MOLTEN METAL PLATING

Kenichi Asakawa, Fukuoka, and Makoto Yoshida, Kitakyushu, both of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Sep. 15, 1976, Ser. No. 723,626
Claims priority, application Japan, Sep. 16, 1975, 50-110947
Int. Cl.² C23C *1/02, 1/03*
U.S. Cl. 427—300 **5 Claims**

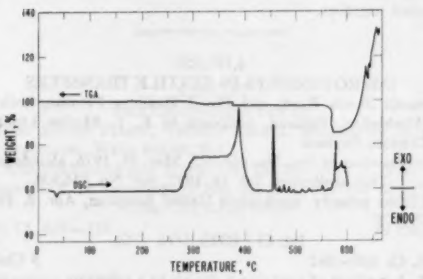


1. A method for effecting application of a one side molten-metal coating to a steel strip in which the steel strip is subjected to activation treatment by heating it in a reducing atmosphere and then dipping it in a molten-metal bath for effecting continuous coating, characterized in that a gas containing oxygen in an amount of 0.001% or more by volume is blown against only one side surface of the steel strip subjected to said activation treatment in a snout part of a line whereby an oxide film is formed on said one side surface, and immediately thereafter the steel strip is dipped in said molten-metal bath to effect coating of the other side.

4,107,358
METHOD FOR PRODUCING A MICA BASED INSULATION

Francis Derrick Bayles, Dollard des Ormeaux, and Michael Alan Dudley, Toronto, both of Canada, assignors to Canada Wire and Cable Limited, Toronto, Canada

Continuation-in-part of Ser. No. 488,408, Jul. 15, 1974, Pat. No. 3,989,875. This application Oct. 29, 1976, Ser. No. 736,852
Claims priority, application Canada, Jun. 21, 1974, 203081
Int. Cl.² B32B *15/00;* D02G *3/00*
U.S. Cl. 427—379 **8 Claims**



1. A method of producing a mica based composite comprising the steps of:

(a) solubilizing a poly (carborane siloxane) containing carborane moieties linked by siloxy groups in a suitable solvent at a loading between 20 and 50% weight by weight of total solution to form a solution consisting essentially of said poly (carborane siloxane) and said solvent;

(b) placing a mica sheet of a desired thickness on a support;

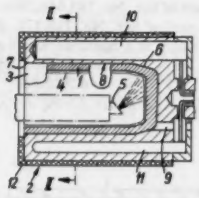
(c) impregnating the supported mica sheet with the solution so as to achieve complete wetting; and

(d) curing the impregnated mica sheet by oxidative crosslinking for a predetermined time interval and at a predetermined temperature above which oxidative crosslinking of the polymer becomes significant, but below which oxidative crosslinking becomes catastrophic, as determined by differential scanning calorimetry.

4,107,359
METHOD OF DRYING COATED CANS

Karl-Heinz Witt, Recklinghausen, and Walter Sommer, Essen, both of Fed. Rep. of Germany, assignors to Fried. KRUPP Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Continuation of Ser. No. 246,420, Apr. 21, 1972, abandoned. This application Nov. 13, 1973, Ser. No. 415,364
Claims priority, application Fed. Rep. of Germany, May 28, 1971, 2126598
Int. Cl.² B05D *3/02, 7/22;* F26B *3/20*
U.S. Cl. 427—388 R **3 Claims**



1. The method of coating and drying one surface of a can having inside and outside surfaces, which includes the steps of:

placing the can with one of said surfaces in contact substantially throughout said one surface with a complementary surface of a heating element;

heating said element and can and controlling said heating not to exceed the optimum temperature of said can for drying the coating material;

coating the other surface of said can while in contact with said heating element, so that the heat from said heating element is transferred to said can to heat the coating material through the material of said can.

4,107,360
PROCESS FOR PACKING A PASTY STAIN REMOVER IN PORTION CAPSULES

Heinz Schmidgall, Teufen, Switzerland, assignor to Sagapha A. G., Zug, Switzerland

Continuation-in-part of Ser. No. 738,890, Nov. 4, 1976. This application Jun. 28, 1977, Ser. No. 810,773
Int. Cl.² B05D *3/02*
U.S. Cl. 427—389 **2 Claims**

1. In a method for packaging a basically anhydrous pasty stain remover which is substantially free of low molecular weight alcohols in portion capsules using gelatine as the supporting wall material of the portion capsules, said capsules being sufficiently large only to contain a sufficient amount of stain remover to treat a typical individual stain and being deformable under the influence of pressure, wherein the improvement comprises: coating the (finished, filled) exterior surface of the capsule material with a solution of a water-insoluble plastic material in a chlorinated hydrocarbon characterized in that said solution consists of from about five to twenty parts of post-chlorinated polyvinyl chloride per 100 parts of finished solution in a solvent selected from the group consisting of chloroform, methylene chloride, dichloroethane, trichloroethane and trichloroethylene and combinations thereof.

4,107,361
NEEDLE-PUNCHED GRASS-LIKE CARPETS

Phillip H. Parker, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

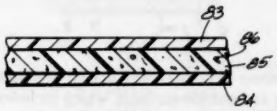
Filed Jan. 30, 1975, Ser. No. 545,443
Int. Cl.² B32B *3/02, 33/00*
U.S. Cl. 428—17 **10 Claims**

1. A carpet having a grass-like appearance comprising 1–20 plies of a fibrous web, consisting of ribs interconnected by fibrils, and made by fibrillating a film having a thickness of about 0.3 to 3 mils, needle-punched into a non-fibrillated substrate having a thickness of about from 0.05 to 1 inch and wherein said needle-punched fibrous web forms the pile of said carpet and has a grass-like appearance and wherein said substrate strengthens and stabilizes said carpet.

4,107,362
MULTILAYERED CONTAINER

Emery I. Valyi, 5200 Sycamore Ave., Riverdale, N.Y. 10471

Continuation-in-part of Ser. No. 743,644, Nov. 22, 1976, which is a continuation-in-part of Ser. No. 710,171, Jul. 30, 1976, Pat. No. 4,048,361, which is a continuation-in-part of Ser. No. 518,264, Oct. 29, 1974, abandoned. This application Jun. 27, 1977, Ser. No. 810,080
Int. Cl.² B65D *23/00, 23/02*
U.S. Cl. 428—35 **10 Claims**

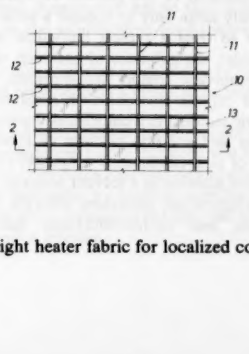


1. A seamless multilayered hollow plastic container having improved resistance to gas permeation comprising: an inner first plastic carrier layer containing an effective amount of a uniformly distributed getter material capable of binding unwanted gas; a second intermediate barrier plastic layer adjacent said first layer, said barrier layer having substantial but incomplete resistance to gas permeation; and a third pressure molded outer plastic layer adjacent said second layer, said layers being adhered one to adjacent layers substantially over their entire contacting areas, wherein said container has a bottom and side walls integral therewith and extending therefrom terminating in an open mouth suitable for being closed by a cover having improved resistance to unwanted gas permeation.

4,107,363
LIGHTWEIGHT ELECTRICALLY-POWERED FLEXIBLE THERMAL LAMINATE

Frederic S. Dawn, and Dale G. Sauers, both of Houston, Tex., assignors to The United States of America as represented by the Administrator, National Aeronautics and Space Administration, Washington, D.C.

Filed Jan. 14, 1975, Ser. No. 540,779
Int. Cl.² B32B *5/00*
U.S. Cl. 428—109 **4 Claims**



1. A lightweight heater fabric for localized controlled heating in vacuum and non-vacuum environments where weight, bulk and stiffness are critical, comprising

a thin electrically non-conductive film forming a base member,

a matrix formed from cross-layers of yarns composed of electrically conductive metal yarns and electrically non-conductive yarns where said metal yarns are separated from one another,

said film and matrix being integrally attached to one another, and said film being metalized on the side obverse to said matrix.

4,107,364
RANDOM LAID BONDED CONTINUOUS FILAMENT CLOTH

James Bryant Sisson, Hamilton, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 6, 1975, Ser. No. 584,312
Int. Cl.² B32B *3/00*
U.S. Cl. 428—196 **41 Claims**

1. Cloth comprised of at least two types of organic polymer fibers, at least one of which is elastomeric, at least one of which is elongatable but non-elastic, at least one of which is dispersed to provide frequent random fiber crossings at least some of which are bonded at a bond strength which is sufficient to enable the non-elastic fibers to be stretched between said bonds without, in the majority of instances, breaking those bonds, said bonded crossings including at least some wherein said elongatable fibers are heat bonded to each other, at least some wherein said elongatable fibers are heat bonded to said elastic fibers, and at least some wherein said elastic fibers are heat bonded together.

4,107,365
IMPROVEMENTS IN TEXTILE TRANSFERS

Kenneth James Reed, and David Wellings Pointon, both of Wimbledon, England, assignors to E. T. Marler Limited, London, England

Continuation of Ser. No. 668,053, Mar. 18, 1976, abandoned. This application Jul. 18, 1977, Ser. No. 816,836
Claims priority, application United Kingdom, Apr. 3, 1975, 13792/75
Int. Cl.² B32B *3/16, 7/06*
U.S. Cl. 428—202 **5 Claims**

1. A method of applying a design to a substrate comprising the steps of:

(a) applying the design to a flexible carrier sheet;

(b) applying to the surface of said design a thermoplastic polymer containing layer of a heat sensitive adhesive polymer which contains a liquid component to reduce the adhesive bond between the design and the carrier sheet;

(c) placing the composite thus formed with the adhesive layer in contact with the substrate;

(d) applying heat and pressure to the carrier sheet to cause adhesion thereof and transference of the design to the substrate; and

(e) thereafter peeling off the carrier sheet to reveal the design.

5. A transfer sheet comprising a flexible carrier sheet provided with a dry ink design, and having a thermoplastic poly-

mer containing layer of a heat sensitive adhesive polymer containing a liquid component applied over said design which polymer layer serves to reduce the adhesive bond of the design relative to the carrier sheet, the composite thus formed being arranged to be applied to a textile material by application of heat and pressure whereupon the carrier sheet is removed from the textile material.

4,107,366

GLASS-PLASTIC LAMINATES

Raymond G. Rieser, Lower Burrell, and Joseph Chabal, Curtisville, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 181,137, Sep. 16, 1971, Pat. No. 3,808,077. This application Jan. 30, 1974, Ser. No. 438,077

Int. Cl.[2] B32B *7/02, 17/10, 27/00*

U.S. Cl. 428—215 **5 Claims**

1. A curved laminated window comprising an outer sheet of curved glass, an inner layer of polyvinyl butyral bonded on one side to said sheet of curved glass and a layer of polyvinyl fluoride bonded to said sheet of polyvinyl butyral on the side opposite to the side bonded to said outer sheet of curved glass.

4,107,367

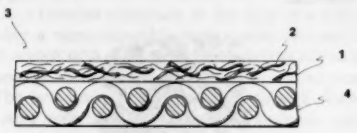
PAPERMAKERS FELTS

Eugene Zoltan Fekete, Vienna, Austria, assignor to Huyck Corporation, Wake Forest, N.C.

Continuation-in-part of Ser. No. 738,208, Nov. 3, 1976, abandoned. This application Jun. 16, 1977, Ser. No. 807,271

Int. Cl.[2] B32B *5/06*

U.S. Cl. 428—234 **10 Claims**



1. In a felt for use in a papermaking machine, the improvement which comprises a nonwoven sheet-contacting layer for said felt, said sheet-contacting layer as initially formed being composed of at least a minor proportion of flat fibers having cross-sectional dimensions which are longer than they are wide, the remainder of the fibers in said sheet-contacting layer being of other than flat fibers, said sheet-contacting layer being joined to one surface of said felt.

4,107,368

WATER REPELLANT FABRICS

Walter James Ratcliffe, Montreal; Robert W. Kolb, Beaconsfield, and S. Esson Bruce, Mount Royal, all of Canada, assignors to Dominion Textile Limited, Montreal, Canada

Filed Sep. 23, 1976, Ser. No. 725,875

Claims priority, application United Kingdom, Oct. 7, 1975, 40982/75

Int. Cl.[2] B32B *7/00*

U.S. Cl. 428—245 **24 Claims**

1. A method of making a water repellent fabric consisting of combining into the fabric structure at least one strand chosen from at least one of animal fibres, polyamide, cellulose acetate, cellulose triacetate, silk, polyester, acrylic and wool, the chosen strand having been rendered water repellent by applying thereto prior to the combination of said strand into said fabric structure at least one complex chosen from the long chain fatty acid complexes of chromium and aluminum.

4,107,369

FABRIC HAVING AN ELASTOMER COAT ON FACE AND METHOD OF PRODUCING SAME

Eric Richard Gardner, Bath, England, assignor to Avon Rubber Company Limited, Melksham, England

Filed Sep. 22, 1976, Ser. No. 725,450

Int. Cl.[2] B32B *7/00*

U.S. Cl. 428—246 **20 Claims**

1. The method of treating thermoplastic yarn having a plurality of thermoplastic filaments to at least reduce the capillary attraction of the interfilament spaces comprising distorting the filaments by: heating the yarn to a temperature sufficient to soften the thermoplastic material of the filaments, tensioning the yarn while the thermoplastic material is softened by said heating, maintaining such heating and tensioning for a time sufficient to insure distortion of the filaments and at least reduction of the interfilamentary space; cooling the yarn to set the filaments in their distorted state to permanently reduce the interfilament spaces whereby the capillary attraction of said yarn is reduced or eliminated; making up said yarn into thread; weaving said thread into a fabric; and finally securing an elastomer to at least one face of the fabric.

4,107,370

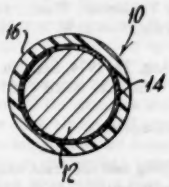
THERMOPLASTIC RESINOUS PROTECTIVE COATING ON A METALLIC SUBSTRATE

Glen E. Ingraham, R.D. 3, Sheridan Rd., Lebanon, N.J. 08833

Division of Ser. No. 384,374, Jul. 31, 1973, Pat. No. 3,941,866. This application Feb. 27, 1976, Ser. No. 661,866

Int. Cl.[2] B29F *3/10;* **B29C** *25/00*

U.S. Cl. 428—247 **25 Claims**



1. A protectively coated metallic substrate in the form of a fence material comprising as a first ply a resinous hot melt adhesive coating composed by weight of from 20 to 400 parts

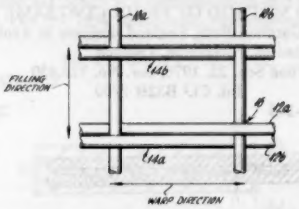
of phenolic-modified terpene resin for each 100 parts of ethylene-vinyl acetate copolymer, bonded to said substrate; and a second coating of an extrudable thermoplastic resin composition selected from a plasticized vinyl resin, a polyolefin, and a polyamide adhering to said substrate by means of said adhesive.

4,107,371

WOVEN FABRIC THAT IS RELATIVELY STIFF IN ONE DIRECTION AND RELATIVELY FLEXIBLE IN THE OTHER

William Bruce Dean, Cornelia, Ga., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Oct. 25, 1977, Ser. No. 844,673
Int. Cl.[2] B32B *7/00*
U.S. Cl. 428—255 **7 Claims**



1. An open weave fabric that is relatively stiff in the filling direction and relatively flexible in the warp direction, said fabric comprising (a) a plurality of individual, spaced, stiff monofilaments in parallel relationship in the filling direction, and (b) a plurality of groups of at least two substantially parallel strands closely associated in side-by-side relationship in the warp direction, said groups being spaced to provide an open weave mesh pattern therebetween, the strands of each of said groups being arranged one strand over and the next strand under in alternating interlocking relationship at the point of crossing each of the respective individual monofilaments in the filling direction, wherein each of said strands comprises a multi-filament yarn core coated with a thermoplastic polymer sheath, and wherein said open weave fabric is stabilized by fusion of said thermoplastic polymer at the point where said strands cross the said individual monofilaments.

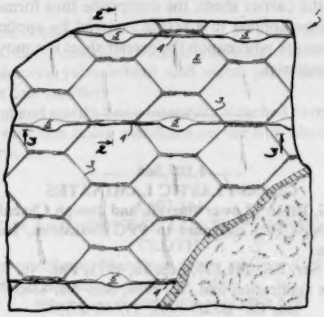
4,107,372

COMPOSITE

Victor H. Clausen, Vancouver, Wash., and Lester C. Brenno, Woodside, Calif., assignors to H. B. Fuller Company, St. Paul, Minn.

Filed Aug. 22, 1974, Ser. No. 499,651
Int. Cl.[2] B32B *7/00*
U.S. Cl. 428—256 **10 Claims**

1. A composite comprising:
(a) A substrate;
(b) A mesh overlying said substrate, said mesh being retained upon but not substantially adhesively bonded to said substrate, thereby permitting some lateral movement of the substrate relative to the mesh;
(c) A plurality of retaining bands overlying said mesh and bonded to said substrate, the loci of bonding being located within the areas of said substrate underlying the holes in said mesh, whereby the mesh is not substantially bonded



to the retaining bands; said retaining bands being adhesive coated, generally continuous filaments.

4,107,373

FLAME RETARDANT CELLULOSIC MATERIALS

George T. Miller, Lewiston, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Dec. 30, 1975, Ser. No. 645,156
Int. Cl.[2] C09D *5/18*; B32B *33/00*
U.S. Cl. 428—264 **16 Claims**

1. Fire retardant cellulosic containing material, which material contains an effective fire retardant amount of a reaction product obtained by reacting an aqueous solution of sulfamic acid containing from about 1 to about 40% by weight of sulfamic acid with an amount of an alkylene oxide which is from about 0.5 to about 1.5 times the weight of 100% sulfamic acid intimately associated therewith.

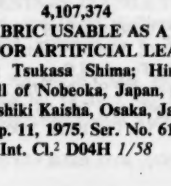
12. The process of rendering cellulosic containing material fire retardant which comprises intimately associating with the material an effective fire retardant amount of the reaction product obtained by reacting an aqueous solution of sulfamic acid containing from about 1 to about 40% by weight of sulfamic acid with an amount of an alkylene oxide which is from about 0.5 to about 1.5 times the weight of 100% sulfamic acid intimately associated therewith.

4,107,374

NON-WOVEN FABRIC USABLE AS A SUBSTRATUM SHEET FOR ARTIFICIAL LEATHER

Tetsuhiro Kusunose; Tsukasa Shima; Hiroshi Henmi, and Sadahiko Yasui, all of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Sep. 11, 1975, Ser. No. 612,504
Int. Cl.[2] D04H *1/58*
U.S. Cl. 428—288 **8 Claims**



1. A non-woven fabric usable as a substratum sheet of artificial leathers, comprising numerous fibrous bundles, each comprising a plurality of extremely fine filaments or fibers having a denier of 0.005 to 0.5 and spontaneously adhered to each other side-by-side without using an adhesive, a portion of said

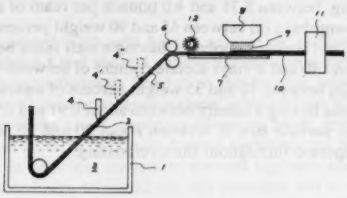
fibrous bundles being divided into thin fibrous bundles and individual filaments or fibers, said thin fibrous bundles, said individual filaments or fibers and the remaining fibrous bundles being entangled with each other to form a body of non-woven fabric.

4,107,375

BULKY ASPHALT-IMPREGNATED SHEET HAVING DIFFERENT PROPERTIES ON BOTH SURFACES

Hajime Iwasaki, and Yasuo Tomita, both of Tokyo, Japan, assignors to Mitsuboshi Sangyo Co., Ltd., Japan

Filed May 4, 1976, Ser. No. 683,214
Claims priority, application Japan, Dec. 30, 1975, 51-156331
Int. Cl.² B32B *11/02*
U.S. Cl. 428—291 **6 Claims**



1. A method of manufacturing a bulky asphalt-impregnated sheet having asphalt on one side and a material different from the asphalt and which has different physical properties therefrom on the other side of the sheet which comprises continuously feeding a bulky sheet of a non-woven fabric into a bath of molten asphalt so as to completely saturate said bulky sheet with the molten asphalt, withdrawing said bulky sheet completely saturated with and coated on both sides thereof by the molten asphalt into the atmosphere from said bath, scraping off the asphalt, when it is in a fluidized or semi-solidified state, from one side of said sheet to expose the fibrous surface of one side of said sheet having very little asphalt remaining on the surface thereof so as to form a rough surface and then applying a material different from that of said asphalt onto the exposed fibrous surface so as to firmly adhere said material different from that of the asphalt onto the rough face of the exposed fibrous surface taking advantage of the adhesive property of the asphalt between the fibers of the exposed fibrous surface.

4,107,376

GRANULATED FIRE RETARDANT MATERIALS

Takashi Ishikawa, 1355, Ohaza Higashine-ko, Higashine-shi, Yamagata-ken, Japan

Filed May 27, 1976, Ser. No. 664,067
Claims priority, application Japan, Jun. 24, 1975, 50-79491
Int. Cl.² B32B *3/26, 5/18*
U.S. Cl. 428—306 **25 Claims**

1. A heat-resistant composite in the form of a solid sphere comprising a noncombustible porous core material impregnated or coated with an inorganic material capable of foaming spontaneously when heated at an elevated temperature.

11. The heat-resistant composite of claim 1 wherein the porous core material is perlite and the inorganic material is sodium metaborate.

12. The heat-resistant composite of claim 11 wherein the surface of the porous core material is covered with a thin impermeable film.

13. A flame and heat-resistant panel comprising polyurethane foam molded in the form of a panel and having incorporated therein the composite of claim 2 as an aggregate.

14. A flame and heat-resistant structure comprising the panel of claim 13 sandwiched between a facing material and a backing material.

4,107,377

PROCESS FOR PRODUCING 3-TRICHLOROMETHYL-5-LOWERALKYLAMINO-1,2,4-THIADIAZOLE

John H. Tobin, Winsted, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Aug. 1, 1977, Ser. No. 821,024
Int. Cl.² C07D *285/08*
U.S. Cl. 260—306.8 D **22 Claims**

1. A process for producing 3-trichloromethyl-5-loweralkylamino-1,2,4-thiadiazole compounds comprising
reacting an N-loweralkylisothiocyanate with an N-halotrichloroacetamidine in the presence of a base to form said 3-trichloromethyl-5-loweralkylamino-1,2,4-thiadiazole compound.

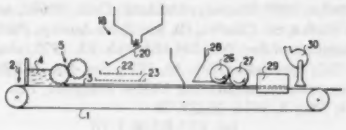
14. A process of producing an N-[3-trichloromethyl-1,2,4-thiadiazolyl (5)]-N,N'-di-loweralkylurea compound by reacting a loweralkylisocyanate with said 3-trichloromethyl-5-loweralkylamino-1,2,4-thiadiazole produced by the process of claim 1.

4,107,378

METHOD AND APPARATUS FOR MANUFACTURING LINING PLATES AND PRODUCTS THEREOF

Guy Clément Bourguignon, Saint Amand Les Eaux, and Joseph André Maquet, Lecelles, both of France, assignors to S.A. dite "Manufacture Francaise de Carrelages", Amand Les Eaux, France

Filed Aug. 9, 1976, Ser. No. 712,763
Claims priority, application France, Aug. 27, 1975, 75 26950
Int. Cl.² B28B *1/16*
U.S. Cl. 428—323 **8 Claims**



1. A method of manufacturing covering plates having a base of hard materials, granulated and pulverulent matter, respectively, agglomerated with synthetic resins, comprising the following successive operations
coating a conveyor belt with a stripping agent,
uniformly depositing on the converyor belt a fine layer of binding agent of uniform thickness of accelerated catalyzed synthetic resin, containing hard pulverulent matter from 10 to 300 microns exclusively, and dyes, regularly and in graded manner by a binding agent distributor,
sprinkling dried and clean granules of a size from 1.5 mm to 10 mm exclusively, mixed in favorable proportions, on the layer of binding agent, the sprinkling being effected by a doser distributor spreader,
coating the granules prior to the sprinkling step with a wetting agent methyl methacrylate, the preceding operations being conducted by varying the speed of the belt, the thickness of the layer of binding agent, its fluidity, and the quantity of granules introduced into the binding agent so as to obtain an aggregate to binding agent weight ratio as high as possible,
vibrating the following section of the conveyor belt, effecting a sedimentation of the granules until the level of the binding agent has risen above said granules, thereby effecting a complete integration and homogeneous distribution of the granules in the binding agent,
covering the resulting strip with a base layer of granules which adhere on the upper surface of the strip,
vibro-compressing the resulting strip with rollers,
passing the resulting strip into a polymerization furnace,
recovering excess granules by suction from the base layer of the resulting layer,

removing the strip from the conveyor belt,
guillotining and cutting the removed strip into plates of large dimensions,
coarse polishing the faces of the plates on a grindstone,
fine finishing the faces of the plates,
sawing the plates to desired sizes, and
passing the plates into a final furnace.

6. Thin covering plates constituting a product obtained by carrying out the method as set forth in claim 1, comprising
a plate having a smooth, finished and polished surface, said plate comprising a fine layer of polymerized and solidified binding agent containing synthetic resin and at least hard pulverulent matter of approximately 200% of the weight of the resin, the pulverulent matter having the size of 10 to 300 microns,
said plate including granules wetted with methyl methacrylate of a size exclusively from 1.5 mm to 10 mm, excluding sizes of 300 microns to 1.5 mm inserted throughout the binding agent,
a base layer of coarse granules adhering to the other surface of the plate and embedded only a small amount into said binding agent, said other surface constituting a bottom surface of the plate adapted to be laid downwardly in use, said first mentioned surface being upward and visible in use,
said coarse granules on said bottom surface being ground so as to define a planar surface adapted to be laid planar in use.

4,107,379

BONDING OF SOLID LIGNOCELLULOSIC MATERIAL

John Stofko, 5079 Kearney, Oakland, Calif. 95602, assignor to John Stofko, St. Charles, Ill. and John Jansky, Paris, France

Continuation of Ser. No. 549,663, Feb. 13, 1975, abandoned. This application Feb. 10, 1977, Ser. No. 767,261
Claims priority, application United Kingdom, Feb. 22, 1974, 8084/74; May 8, 1974, 20227/74
Int. Cl.[2] B32B *5/16*
U.S. Cl. 428—326 **21 Claims**

1. A method of providing a waterproof bond between solid lignocellulose materials, comprising:
applying to the surface of said solid lignocellulose material an amount sufficient to effect bonding comprising in the range of from 2 to 32 grams of carbohydrate per 1,000 cm^2 of area of material of a bonding composition comprising a non-cellulosic carbohydrate and an acid catalyst capable of catalyzing transformation of the carbohydrate, the amount of acid catalyst being from 1 to 20% by weight of the carbohydrate; and
pressing said solid lignocellulose materials together at about 140°–200° C at a pressure in the range of about 5–25 kg/cm^2 for about 0.32 to 2 minutes per mm of thickness of said solid lignocellulose materials to transform said carbohydrate into furan type compounds and form said waterproof bond.

2. A method of bonding solid lignocellulosic materials producing a waterproof bond, which comprises
applying to the surface of the material a bonding composition consisting essentially of a non-cellulosic carbohydrate and an acid catalyst capable of catalyzing transformation of the carbohydrate, said carbohydrate being present in an amount sufficient to coat the surface of said material, and said catalyst being present in an amount sufficient to catalyze transformation of said carbohydrate to produce a waterproof bond, and
pressing surfaces of the material together at an elevated temperature and for a time sufficient to effect bonding by transformation of the carbohydrate, and wherein the time, temperature and pressure are sufficient to produce a waterproof bond.

4,107,380

NON-BLOCKING COATING COMPOSITION

Dale Clifford Wiesman, Neenah, Wis., assignor to American Can Company, Greenwich, Conn.

Filed Nov. 12, 1976, Ser. No. 741,232
Int. Cl.[2] B32B *5/16, 9/02*; B65D *85/72*
U.S. Cl. 428—327 **8 Claims**

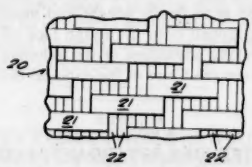
1. A flexible packaging sheet material bearing on its surface a coating of a normally tacky heat-sealable wax composition selected from the group consisting of (1) microcrystalline petroleum wax and polyisobutylene and (2) ethylene-vinyl acetate copolymer, petroleum wax and a tackifying resin, (3) microcrystalline wax, petrolatum and polyisobutylene and (4) ethylene-vinyl acetate copolymer, paraffin wax, butyl rubber, rosin ester and microcrystalline wax, there being applied to the surface of said wax composition coating, as a non-blocking overcoating, between 0.75 and 4.0 pounds per ream of a composition comprising (a) between 65 and 90 weight percent of an ethylene-vinyl acetate copolymer having a melt index between about 20 and 40 and a vinyl acetate content of between 18 and 30% and (b) between 10 and 35 weight percent of a particulate polyethylene having a density between about 0.91 and 0.94 and an average particle size of between about 20 and 50 microns evenly dispersed throughout the overcoating.

4,107,381

COMPOSITE ARTICLE PROVIDING SEAMLESS FABRIC-LINED BEARINGS IN MULTIPLE

Neil W. Butzow, Greendale, and Bernhard Harris, Milwaukee, both of Wis., assignors to Rexnord Inc., Milwaukee, Wis.

Continuation of Ser. No. 398,367, Sep. 18, 1973, abandoned, which is a division of Ser. No. 730,399, May 20, 1968, Pat. No. 3,616,000, which is a continuation of Ser. No. 95,363, Dec. 4, 1970, abandoned. This application Mar. 9, 1976, Ser. No. 665,203
Int. Cl.[2] B32B *1/08, 17/06*
U.S. Cl. 428—365 **17 Claims**

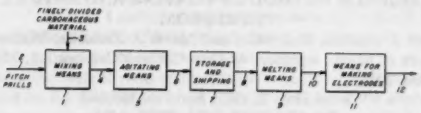


1. An article of manufacture adapted with further processing to provide an improved bearing of the type which comprises a glass filament reinforced resin body and a fabric embedded therein and having yarns of a low friction material forming the bearing face, said article of manufacture comprising:
(a) a mandrel having substantially the outer dimensions of the element which is to operate in the bearing;
(b) a seamless woven sleeve comprising a circumferential fill of heat-shrinkable yarns and an axial warp of low-friction yarns, said sleeve having been drawn over said mandrel while the heat-shrinkable yarns were in an unshrunk condition and then having been heat shrunk so as to conform the low-friction yarns in said sleeve to the outer surface of said mandrel; and
(c) multiple layers of a continuous glass filament tape impregnated with a thermosetting liquid resin tightly and helically wound around said sleeve so as to further press the low-friction yarns in said sleeve against said mandrel, conforming the inner surface of the low-friction yarns to the outer surface of said mandrel.

4,107,382
COATED PITCH PRILL

Harry G. Augustine; Kenneth C. Krupinski, both of Pittsburgh, and Frank A. Smith, Franklin Township, Westmoreland County, all of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 637,262, Dec. 3, 1975, Pat. No. 4,082,823. This application Sep. 9, 1976, Ser. No. 721,745
Int. Cl.[2] B32B *11/02*
U.S. Cl. 428—368 10 Claims



1. A coated pitch prill having an average diameter of between about 1 and about 5 millimeters and comprising a pitch prill having adherently bonded to the exterior layer thereof finely divided carbonaceous material selected from at least one member of the group consisting of carbon black, graphite and coke and wherein the finely divided carbonaceous material is present in sufficient amount to prevent agglomeration of the prills at ordinary temperatures and pressures and in sufficient amount to reduce the dusting tendency of the prills during handling.

4,107,383
ELECTRIC CABLE INSULATING COMPOSITIONS CONTAINING COCONUT SHELL FLOUR FILLER

Brian C. Reid, 3 Pump Ct., London Temple, E.C. 4, England

Filed Feb. 14, 1977, Ser. No. 768,043
Int. Cl.[2] B44D *1/42;* C08L *1/00*
U.S. Cl. 428—379 6 Claims

1. An electric cable comprising a conductor and an insulating jacket of a composition containing a synthetic thermoplastic or rubbery organic polymeric insulating material and, as filler therefor, coconut shell flour, the proportion of coconut shell flour to insulating material being from 5 to 30 parts per 100 parts by weight.

4,107,384
METHOD FOR PRODUCING POROUS FIBERS

Morito Musha, Seto, and Tokuhisa Miyamatsu, Nagoya, both of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

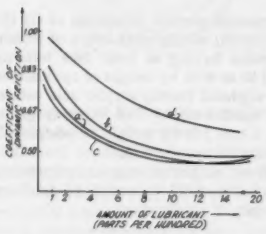
Filed Aug. 10, 1976, Ser. No. 713,033
Int. Cl.[2] B29F *3/10*
U.S. Cl. 428—398 13 Claims

1. A method for producing porous cross-linked monovinyl polymer fibers, which comprises: impregnating substrate fibers capable of being swollen by 30–500 volume % with a mixed monomer liquid comprising at least one monovinyl monomer and at least one polyvinyl monomer which liquid monomer mixture contains a polymerization initiator such that said liquid monomer mixture is homogenously absorbed by the swollen substrate; polymerizing the monomer mixture absorbed in the fibers; and then removing the substrate fibers from the polymerized monomer mixture.

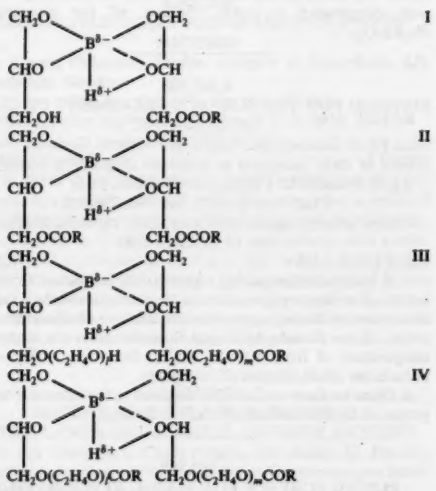
4,107,385
MAGNETIC RECORDING MEDIUM

Shigetaka Higuchi, Sendai; Masaatsu Iwasaki, Iwanuma, and Shigeo Kimura, Sendai, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 387,591, Aug. 13, 1973, abandoned. This application May 21, 1975, Ser. No. 579,471
Claims priority, application Japan, Aug. 14, 1972, 47-81265
Int. Cl.[2] H01F *10/02*
U.S. Cl. 428—412 13 Claims



1. A magnetic recording medium comprising a base, and a magnetic layer coated on the base and consisting essentially of a binder and a magnetic powder and, in admixture therewith, for each 100 parts by weight of said binder, from 1 to 15 parts by weight of a friction-reducing additive selected from the boron compounds having any one of the following structural formulas:



in which $B^{\delta-}$ represents a boron atom with a negative electric charge which has a low bonding force, $H^{\delta+}$ represents a hydrogen atom with a positive electric charge which also has a low bonding force, R represents an alkyl group containing from 7 to 21 carbon atoms, each of *l* and m is a numerical value from 1 to 20 and the sum of the numerical values of *l* and m is no greater than 24.

4,107,386

ANAEROBICALLY HARDENING ADHESIVES AND SEALANTS BASED ON (METH)ACRYLIC ESTERS CONTAINING POLYCARBONATES TERMINATED BY (METH)ACRYLIC ESTER GROUPS

Werner Gruber, Düsseldorf-Gerresheim; Joachim Galinke, Langenfeld, and Bernd Wegemund, Haan, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf-Holthausen, Fed. Rep. of Germany

Filed Feb. 22, 1977, Ser. No. 770,386

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1976, 2607959

Int. Cl.[2] C08L *67/06*

U.S. Cl. 428—412 21 Claims

1. An anaerobically setting adhesive and sealing composition comprising

A. a polymerizable portion consisting of (i) 10 to 90% by weight of (meth) acrylic acid esters of terminal hydroxy polycarbonates having at least two terminal hydroxyl groups, (ii) 10 to 40% by weight of cycloaliphatic, heterocyclic, or aliphatic (meth) acrylic acid esters, which are optionally substituted by free hydroxy groups, and (iii) optionally 0.1 to 5% by weight of additional polymerizable, unsaturated compounds,

B. 0.1 to 20% by weight of organic hydroperoxides, and

C. optionally 0.05 to 5.0% by weight of stabilizers and 0.1 to 5% by weight of accelerators.

4,107,387

RESISTANCE MATERIAL

Alexander Hendrik Boonstra, and Cornelis Adrianus H. A. Mutsaers, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 8, 1977, Ser. No. 775,457

Claims priority, application Netherlands, Mar. 15, 1976, 7602663

Int. Cl.[2] H01B *1/08*

U.S. Cl. 428—426 13 Claims

13. A resistance body comprising a substrate to which a resistance material is adhered consisting of a mixture of a glass binder and metal oxides with a resistance-determining component comprising a metal rhodate of the composition $Pb_3Rh_7O_{15}$.

4,107,388

METHOD FOR THE SURFACE TREATMENT OF GLASS BY LEACHING

Gian Paolo Gambaretto, Padua, and Vittorio Gottardi, Venice, both of Italy, assignors to Industrie Zignago S. Margherita S.p.A, Fossalta Di Portogruaro (Venice), Italy

Filed Feb. 9, 1977, Ser. No. 766,968

Claims priority, application Italy, Feb. 16, 1976, 20198 A/76

Int. Cl.[2] C03C *15/00*

U.S. Cl. 428—428 7 Claims

1. A method of preparing a glass surface resistant to chemical attack which comprises contacting the glass surface with an air stream containing an equilibrium mixture of silicon tetrafluoride, silicon dioxide, hydrogen fluoride and water vapor at a temperature of from 400° to 700° C for a time sufficient to reduce the alkali content of said glass.

6. Glass surfaces and articles resistant to the chemical attack, prepared by the method of claim 1. having

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4,107,389

FUSING SURFACE FOR FIXING XEROGRAPHIC TONER

Richard J. Murphy, Norwood, Mass., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 497,411, Aug. 14, 1974, Pat. No. 4,000,339. This application Oct. 18, 1976, Ser. No. 733,685

Int. Cl.[2] B32B *25/20;* G03G *15/20*

U.S. Cl. 428—447 2 Claims

1. A fuser member for an electrostatic copier comprising a substrate having coated thereon a water-degradable silicone rubber having substantially no reinforcing filler and containing a catalytic agent which promotes the degradation of the silicone rubber in the presence of moisture, the surface of said coating comprising the fluid degradaton product of the silicone rubber which is a release material for tackified resin powder.

4,107,390

RADIATION-CURABLE ORGANOPOLYSILOXANE COATING COMPOSITION COMPRISING MERCAPTOALKYL AND SILACYCLOPENTENYL RADICALS, METHOD OF COATING AND ARTICLE THEREFROM

David J. Gordon, Essexville, and Maris J. Ziemelis, Midland, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Dec. 2, 1977, Ser. No. 856,693

Int. Cl.[2] B32B *9/04;* B05D *3/06*

U.S. Cl. 428—447 15 Claims

1. A radiation-curable polydiorganosiloxane composition obtained by mixing components consisting essentially of

(A) a triorganosiloxane-endblocked polydiorganosiloxane fluid having a viscosity of at least 0.5 pascal-seconds at 25° C., wherein from 50 to 99 percent of all organic radicals are methyl, from 1 to 5 percent of all organic radicals are mercaptoalkyl having the formula $—(CH_2)_nSH$, wherein n has a value of from 1 to 4 inclusive, any remaining organic radicals in (A) being phenyl radicals or alkyl radicals having from 2 to 6, inclusive, carbon atoms,

(B) a polymethylvinylsiloxane, compatible with (A) and having an average of at least three vinyl groups per molecule, and

(C) 1,1'-oxy-bis(1-methyl-1-silacyclopentene), the amounts of (A), (B), and (C) being sufficient to provide

(i) a total of from 0.2 to 2.0 silicon-bonded aliphatically-unsaturated radicals for every silicon-bonded mercaptoalkyl radical in the composition, and

(ii) a molar ratio of silicon-bonded vinyl radicals to 1-methyl-1-silacyclopentenyl radicals of from 0 to 1.0.

4,107,391

METHOD FOR MAKING THERMOFORMABLE COMPOSITES AND COMPOSITES MADE THEREBY

James E. Moore, Clifton Park, and Siegfried H. Schroeter, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 423,007, Dec. 10, 1973, abandoned, which is a continuation-in-part of Ser. No. 320,302, Jan. 2, 1973, abandoned. This application Mar. 17, 1977, Ser. No. 778,612

Int. Cl.[2] B05D *3/06*

U.S. Cl. 428—483 12 Claims

1. A substantially pollution-free method for making thermoformable or vacuum formable biaxially stretchable composites exhibiting a biaxial elongation in excess of 200% without failure said method comprising

(1) providing as a substrate, a biaxially stretchable thermoplastic sheet exhibiting biaxially elongation in excess of 200%

(2) coating said biaxially stretchable thermoplastic sheet with a resinous composition to a thickness of up to 5 mils and

(3) effecting the cure of the resinous composition with a source of UV irradiation having a wave length of between 1849A to 4000A, where the resinous composition is a member selected from the class consisting of a

(A) solventless polyester resin containing as essential ingredients

(a) aliphatic unsaturated organic monomer,

(b) an aliphatically unsaturated polyester soluble in (a), and having a MW of from about 2000 to 10,000 which is the reaction product of a $C_{(2-20)}$ glycol free of aliphatic

unsaturation and an aliphatically unsaturated dicarboxylic acid mixture consisting essentially of

(i) α,β-aliphatically unsaturated dicarboxylic acid and an organic dicarboxylic acid selected from the class consisting of

(ii) organic dicarboxylic acid having $C_{(5-30)}$ divalent organic radicals between carbonyl radicals selected from aromatic radicals and cyclic radicals free of aromatic saturation,

(iii) linear saturated aliphatic dicarboxylic acid having 1–3 carbon atoms between carbonyl radicals,

(iv) linear saturated aliphatic dicarboxylic acid having at least 4 carbon atoms between carbonyl radicals and

(c) from 0.5% to 5% by weight based on the weight of (a), (b) and (c) of a UV sensitizer,

where the weight ratio of (a)/(b) has a value of 0.15 to 4 and based on the total moles of (i), (ii), (iii) and (iv) in the aliphatically unsaturated polyester, (i) is present at from 0.01 to 10 mole percent, (ii) is present at from 0 to 99 mole percent, (iii) is present at from 0 to 70 mole percent and (iv) is present at from 0 to 30 mole percent, and

(B) a curable acrylic resin which contains as essential ingredients

(d) methylmethacrylate,

(e) polymethylmethacrylate and

(f) from 0.05 to 5% by weight of (d), (d) and (f) of a UV sensitizer,

where (e) has an average MW of from 1000 to 50,000 and the weight ratio of (d)/(e) is from 0.5 to 1.5.

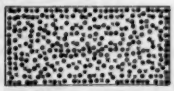
2. A method in accordance with claim 1, where the solventless organic resin is a mixture of styrene and an unsaturated polyester.

4,107,392

HIGH TEMPERATURE ABRASION-RESISTANT MATERIAL AND METHOD OF PRODUCING SAME

Hiroyuki Aoki, Yokohama; Hiroshi Takao, Kamakura, and Akira Oyamada, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Dec. 15, 1976, Ser. No. 750,622
Claims priority, application Japan, Dec. 25, 1975, 50-155485
Int. Cl.² C22C *1/05*
U.S. Cl. 428—547 **19 Claims**



• OXIDE
○ METAL
× HALIDE

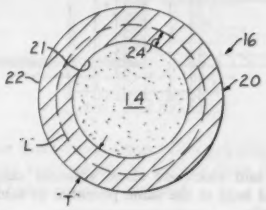
1. A high temperature abrasion-resistant material in the form of a sintered mass consisting essentially of at least one heavy metal oxide selected from the group consisting of NiO and CoO, at least one heavy metal selected from the group consisting of Ni and Co, said at least one heavy metal each being a constituent of at least one heavy metal oxide, and at least one halide of an alkaline earth metal selected from the group consisting of the fluorides, chlorides and bromides of Ca, Ba and Sr, the concentration of the total heavy metal oxide in the sintered mass being maximum at the surface of the mass and continuously decreasing as the depth from the surface increases, the concentration of the total heavy metal in the sintered mass being substantially zero at the surface of the mass and continuously increasing as the depth from the surface increases, the halide being uniformly distributed in the sintered mass.

4,107,393

INOCULATION ARTICLE

John G. Frantzreb, Sr., and C. David Weiss, both of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 14, 1977, Ser. No. 777,387
Int. Cl.² B22D *27/18*; B32B *15/00*; C22C *33/08*
U.S. Cl. 428—558 **4 Claims**



1. An inoculating article for treating a molten metal having a preselected temperature, comprising:

an elongated steel conduit having an internal surface, an external surface and a preselected thickness between said surfaces, said conduit having a melting temperature above said preselected temperature of the molten metal; and

an inoculating material positioned within said conduit, said material consisting essentially of ferrosilicon having a silicon content greater than about 75% by weight and being compacted within said conduit to at least 10% above the tapped density of said material, said ferro-silicon having a melting temperature below said preselected temperature of the molten metal, said silicon content being sufficient for diffusing silicon from said material into said internal surface of said conduit to a value sufficient for lowering the melting temperature of at least 30% of said preselected thickness of said conduit below said preselected temperature.

4,107,394

CORRUGATED SHEET METAL HEAT TRANSFER MEMBER

Rune Almen, Halmstad, Sweden, assignor to Sensotherm AB, Sandviken, Sweden

Filed Jan. 21, 1976, Ser. No. 650,952
Claims priority, application Sweden, Feb. 4, 1975, 7501204
Int. Cl.² F28F *1/12*
U.S. Cl. 428—595 **3 Claims**

1. A sheet metal heat transfer member for providing air channels in a heating system or the like comprising a series of corrugations and one or more rows of recesses formed therein, each of said rows of recesses being for engagement with a tube, each of said corrugations having a first side, a crest, and a second side, each of said recesses having edges located in one of said first sides, one of said crests, and one of said second sides for establishing heat transmitting contact between said member and a tube to be assembled thereon.

4,107,395

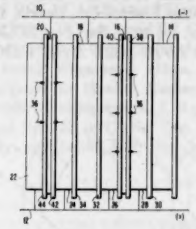
OVERCHARGEABLE SEALED METAL OXIDE/LANTHANUM NICKEL HYDRIDE BATTERY

Gerrit van Ommering, Chevy Chase, and James D. Dunlop, Gaithersburg, both of Md., assignors to Communication Satellite Corporation, Washington, D.C.

Filed Sep. 20, 1977, Ser. No. 834,946
Int. Cl.² H01M *10/34*
U.S. Cl. 429—21 **17 Claims**

1. In a metal oxide-hydride electrode storage battery with an electrode stack having a metal oxide positive electrode and a lanthanum nickel hydride negative electrode, said positive and negative electrodes separated by separator means including separators of two widely different resistances to gas flow

disposed on opposite sides of said positive electrode, the improvement comprising an oxygen reduction catalytic electrode



disposed in said electrode stack adjacent said metal oxide electrode and held at the same potential as said negative hydride electrode.

4,107,396

METHOD AND APPARATUS FOR THE PRODUCTION OF HIGH OUTPUTS WITH HIGH CURRENT DENSITIES IN AN ELECTROCHEMICAL SYSTEM

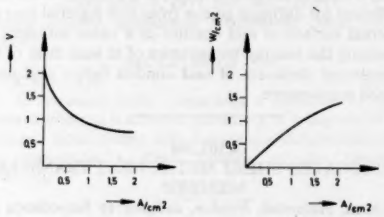
Jean Ruch, Brilon, Germany, assignor to Accumulatorenwerk Hoppecke Carl Zoellner & Sohn, Cologne, Germany

Filed Aug. 1, 1977, Ser. No. 820,779

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1976, 2635251

Int. Cl.² H01M *6/50*

U.S. Cl. 429—26 **18 Claims**



1. A method for the production of high outputs with high current densities in an electrochemical system of a metal-air-cell comprising a consumable electrode, an air electrode and electrolyte disposed between the electrodes, comprising the step of

controlling the heat occurring in the phase boundary interface of the electrode/electrolyte and the existing temperature, respectively, of the metal-air cell in the sense of a heating and/or cooling of the phase boundary interface such that the temperature thereat is substantially different from that of the entire cell.

4,107,397

ELECTRO-CHEMICAL CELLS

Jonathan Moubray Jenkins, Sevenoaks, and Kenneth Henson, Ramsbottom, both of England, assignors to Unigate Limited, London, England

Continuation of Ser. No. 500,763, Aug. 26, 1974. This application Jun. 1, 1976, Ser. No. 691,812

Claims priority, application United Kingdom, Aug. 24, 1973, 40299/73

Int. Cl.² H01M *4/96, 10/00*

U.S. Cl. 429—27 **3 Claims**

1. In a rechargeable zinc-halogen electric cell comprising:

(a) a casing;

(b) storage means external to said casing for storing molecular halogen;

(c) at least one halogen electrode structure located within said casing comprising an apertured substrate consisting essentially of an anodizable metal selected from the group consisting of Groups IV(A) and V(A) of the Periodic Table according to Mendeleef having an inherent oxide layer thereon, said substrate having permanently associated therewith at least one coherent permeable stratum of a mixture of substantially porous carbon and a polymeric binder, said electrode structure having been produced by pressing said mixture of porous carbon and binder at a pressure of at least 2 tons psi onto said substrate to provide said flexible halogen electrode structure, said halogen electrode structure being adapted to provide a space therein in communication with said external storage means for molecular halogen into and through which space molecular halogen can move;

(d) at least one metal bearing anode structure located within said casing including a zinc-containing material supported on an electrically conducting substrate; and

(e) positive and negative electric conductors leading from said electrode structures to terminals accessible to the outside of said casing; and casing being adapted to hold a body of liquid and flowable zinc halide electrolyte in contact with each of said electrode structures, the improvement comprising a separator between each halogen electrode structure and each anode structure, said separator permitting the passage of zinc and halogen ions therethrough but preventing the passage of halogen molecules, whereby diffusion of halogen molecules from said halogen electrode structures to said anodes is prevented and a pH differential between the anolyte and calholyte of 1–2 PH units is maintained.

4,107,398

GAS REMOVAL MEANS FOR STORAGE BATTERIES

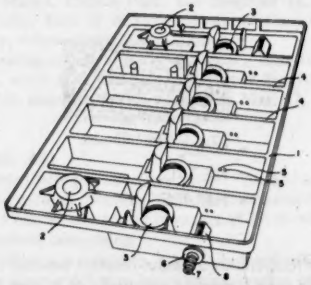
Hans-Georg Lindenberg, and Hans-Joachim Golz, both of Hanover, Fed. Rep. of Germany, assignors to Varta Batterie Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 1, 1976, Ser. No. 737,619

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1975, 7537737[U]

Int. Cl.² H01M *2/12*

U.S. Cl. 429—88 **6 Claims**



1. A housing for a block of cells which together constitute a storage battery, the housing providing for the block of cells a casing and a lid, at least one of which has internal partitions between the adjacent ones of the cells, the housing being characterized by

at least one aperture in each internal partition for the passage between cells of gas evolved in the storage battery, and

coupling means in the outer wall of an end cell for connecting hose means for evacuating the gas evolved in all the cells,

each aperture having a diameter of about 1.5 to 2.0 mm. that being such that evolved gas passage can readily take place without entraining excessive liquid fractions, whereas

exchange of electrolyte in substantial quantities between cells is impeded,

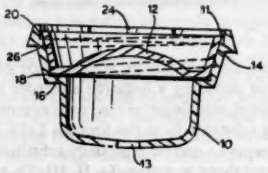
the coupling means having a liquid separator means connected ahead of it, the liquid separator means including a chamber having a sloping bottom with a slot through which liquid entrained in the gases and separated from them in the chamber can flow back downward into the battery,

the slot being so dimensioned that during normal battery operation it retains a layer of the liquid which closes the slot, while permitting liquid to flow downwardly through the slot when additional liquid accumulates during greater-than-normal gas evolution.

4,107,399
VENTED CAP FOR STORAGE BATTERY

Joseph Edmund Claxton, Aurora, Canada, assignor to Somerville Belkin Industries Limited, London, Canada

Filed Nov. 17, 1977, Ser. No. 852,461
Int. Cl.² H01M 2/12
U.S. Cl. 429—89 **6 Claims**



1. A vented cap for a wet cell battery comprising:

a body adapted to form a closure for an opening of a wet cell battery and having an opening therethrough;

a cover for said body;

said cover nesting in said body over an interface;

said interface having a frustoconical portion that extends axially of said body;

a ventilation passage between said body and said cover through said cap, said ventilation passage having a devious flame arresting and gas ventilation section that extends across said interface, said devious flame arresting and gas ventilation section of said passage being defined by said body and said cover at said frustoconical portion of the interface and having a length to arrest passage of flame therethrough in use, and a cross-section large enough to provide ventilation for the battery cell;

said body and said cover having a clearance at said interface apart from said devious flame arresting and gas ventilation section small enough to retard the passage of flame.

4,107,400
BATTERY HATCH COVER

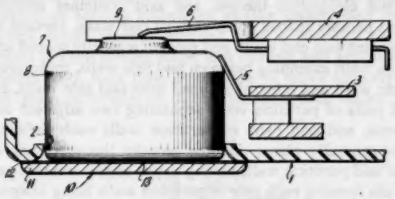
Raymond J. Grohoski, Watertown, Conn., assignor to Timex Corporation, Waterbury, Conn.

Filed Jun. 24, 1977, Ser. No. 809,575
Int. Cl.² H01M 2/10
U.S. Cl. 429—98 **5 Claims**

1. In a battery enclosure containing a battery and having a wall defining an opening therein for inserting at least one battery and having a pair of spring contacts therein connected to an electrically actuated device, the improvement comprising;

a hatch cover having a central portion for covering said opening and having peripheral edges overlapping portions of said enclosure wall,

a tacky adhesive disposed between the hatch cover peripheral edges and the overlapped enclosure wall portions, and

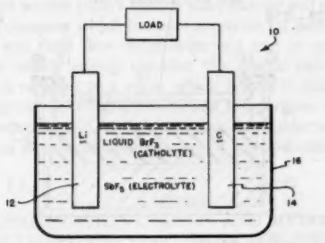


means on the hatch cover temporarily gripping said battery to facilitate removal of the battery from the enclosure when the hatch cover is removed.

4,107,401
SUPER HIGH ENERGY DENSITY BATTERY

Forrest R. Goodson, Campbell; William H. Shipman, La Mesa, and Joseph F. McCartney, Solana Beach, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 24, 1978, Ser. No. 871,877
Int. Cl.² H01M 6/14
U.S. Cl. 429—101 **4 Claims**



1. In a battery the improvement comprising:

a lithium anode;

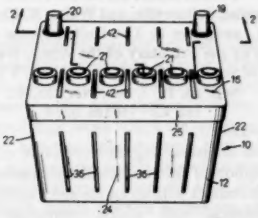
a catholyte solely of liquid bromine trifluoride; and

an electrolyte of antimony pentafluoride.

4,107,402
BATTERY AND BATTERY CONTAINER HAVING AIR-FLOW PASSAGES THERETHROUGH

Thomas John Dougherty, Waukesha; Roy Erving Hennen, Mequon, and John Ronald Pierson, Brookfield, all of Wis., assignors to Globe-Union Inc., Milwaukee, Wis.

Filed Sep. 22, 1977, Ser. No. 835,728
Int. Cl.² H01M 2/02
U.S. Cl. 429—120 **8 Claims**



1. A one-piece molded thin-walled polymer battery con-

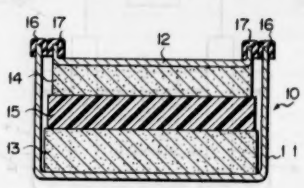
tainer comprising a plurality of unitary individual compartments therein integrally connected and for containing battery grids and electrolyte therein, and said container including opposed parallel spaced apart vertical end walls, vertical side walls joining said end walls, and pairs of mutually spaced apart partition walls extending between said side walls, transverse to said side walls and integrally joined with said side walls, each of said pairs of partition walls separating two adjacent compartments, and said pairs of partition walls each defining a narrow generally planar air-flow passage therebetween, and each of said partition walls having upper edges, and said partition walls forming each pair of partition walls being integrally joined adjacent a portion of their upper edges to form a single thickness partition wall portion, said air-flow passages including two spaced apart portions adjacent said upper edges and on opposite sides of said single partition wall portion.

4,107,403

ELECTROCHEMICAL CELL

Tsutomu Takamura, Kawasaki, and Tamotsu Shirogami, Yamato, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed Oct. 20, 1977, Ser. No. 843,945
Claims priority, application Japan, Oct. 21, 1976, 51-125463
Int. Cl.[2] H01M *2/08*
U.S. Cl. 429—174 **14 Claims**



1. An electrochemical cell comprising a sealed metallic container at least partially composed of an anode metal member and a cathode metal member with their respective edge portions; a power generating material contained in said metallic container; and insulating seal members formed over said respective edge portions, said insulating seal members including coating layers of thermoplastic resin containing a functional group with hydrogen bonding capability and formed on said respective edge portions of the metal members, sealing of said metallic container being achieved by heat-pressure bonding said seal members.

4,107,404

STABILIZATION OF $LIASF_6$/DIMETHYL SULFITE ELECTROLYTE SOLUTION

Robert J. Horning, Sellersville, and Walter B. Ebner, Hartsville, both of Pa., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation of Ser. No. 764,489, Jan. 31, 1977. This application Sep. 15, 1977, Ser. No. 833,401
Int. Cl.[2] H01M *6/14*
U.S. Cl. 429—194 **3 Claims**

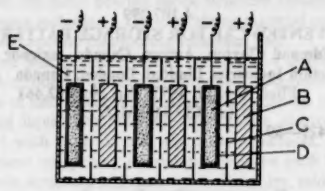
1. A process for stabilizing an electrolyte consisting essentially of a solution of lithium hexafluoroarsenate in dimethyl sulfite prior to contact with an anode and a cathode to produce an electrochemical cell, which comprises incorporating therein lithium metal in an effective amount to increase the storage stability of said solution.

4,107,405

ELECTRODE MATERIALS BASED ON LANTHANUM AND NICKEL, AND ELECTROCHEMICAL USES OF SUCH MATERIALS

Annick Percheron born Guegen, Paris; Jean Claude Achard, Kremlin-Bicetre; Jean Loriers, Meudon; Maurice Bonnemay, Boulogne-Billancourt; Guy Bronoël, Versailles; Joël Sarradin, Elancourt, and Louis Schlapbach, Versailles, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly sur Seine, France

Filed May 21, 1976, Ser. No. 688,537
Claims priority, application France, May 23, 1975, 75 16160
Int. Cl.[2] H01M *10/24*
U.S. Cl. 429—218 **38 Claims**



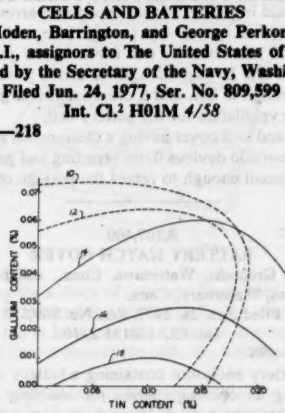
1. An electrochemical energy accumulator of the alkaline electrolyte type including a negative electrode based on lanthanum and nickel, said negative electrode comprising an alloy corresponding substantially to the formula $LaNi_5$ in which one of the components La and Ni is partially substituted by a metal M selected from those in groups Ia, II, III, IV and Va of the periodic table of elements and other than lanthanides, in an atomic proportion which is higher than 0.1% and lower than 25%.

4,107,406

ALUMINUM ALLOY FOR PRIMARY ALKALINE FUEL CELLS AND BATTERIES

James R. Moden, Barrington, and George Perkons, Newport, both of R.I., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 24, 1977, Ser. No. 809,599
Int. Cl.[2] H01M *4/58*
U.S. Cl. 429—218 **4 Claims**

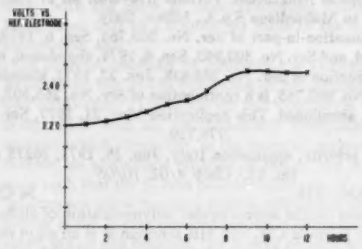


1. An anode for a primary electrochemical energy source consisting essentially of 0.001 to 0.072 percent by weight of gallium, 0.5 to 1.2 percent by weight of magnesium and the balance of aluminum having an initial purity of at least 99.997 percent.

4,107,407
BATTERY AND GRID FOR POSITIVE ELECTRODE FOR LEAD STORAGE BATTERIES

Kjell Koch, Kungälv, Sweden, assignor to Aktiebolaget Tudor, Sundbyberg, Sweden

Filed Feb. 25, 1977, Ser. No. 771,975
Claims priority, application Sweden, Feb. 27, 1976, 76025956
Int. Cl.² H01M 4/56
U.S. Cl. 429—225 10 Claims



1. A grid for a positive electrode for electrical storage battery also including a negative electrode comprising a base of lead or a lead alloy which is essentially free from antimony coated on at least all surfaces which contact active material in the finished electrode with an alloy of lead and from 3 to 95 percent antimony, the amount of antimony being 2 percent or less by weight of the active material utilized in the finished electrode whereby the resulting grid achieves charging potentials of the same magnitude as those achieved with grids formed of lead alloys containing 6 to 12 weight percent antimony while minimizing the possibility of antimony poisoning of a negative electrode.

4,107,408
ACRYLONITRILE COPOLYMERS FOR CARBON FIBERS

Victor Conrad Richard McLoughlin, Farnborough; Roger Moreton, Aldershot, and William Watt, Farnborough, all of England, assignors to National Research Development Corporation, London, England

Filed Oct. 22, 1976, Ser. No. 735,122
Claims priority, application United Kingdom, Oct. 24, 1975, 43828/75
Int. Cl.² C08F 220/44
U.S. Cl. 526—8 3 Claims

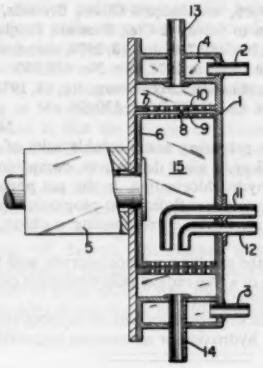
1. An acrylonitrile copolymer suitable for use as a precurosr in the production of carbon fibers which copolymer contains at least one non-acrylonitrile moiety selected from a carbonyl group and two carbon moieties containing a carbonyl group in the polymer backbone, the non-acrylonitrile moiety being present to the extent of about 5 to about 16 molar parts per 100 molar parts of acrylonitrile moiety.

4,107,409
METHOD OF PRODUCING POLYMERS OF HIGH MOLECULAR WEIGHT BY THE TWO-PHASE INTERFACIAL METHOD

Otto Szabolcs, and Hans Schüller, both of Vienna, Austria, assignors to Isovolta Osterreichische Isolierstoffwerke Aktiengesellschaft, Wiener Neudorf, Austria

Filed Jun. 27, 1977, Ser. No. 810,083
Claims priority, application Austria, Jun. 29, 1976, 4764/76
Int. Cl.² C08F 2/00
U.S. Cl. 526—65 5 Claims

1. A process of producing polymers of high molecular weight by the two-phase interfacial method, wherein for the purpose of effecting the polymerization an intimate mixture of two liquid phases which are not miscible with one another is formed, each phase containing at least one reactant, comprising bringing the two liquid phases into contact with one another in a predetermined quantitative ratio to one another and passing the resulting mixture through one mixing stage or a plurality of serially connected mixing stages, said resulting mixture being thereby divided into a plurality of partial streams in each mixing stage, and causing said partial streams together with their flow boundaries to move transversely to their main directions of flow at mean speeds higher than 5

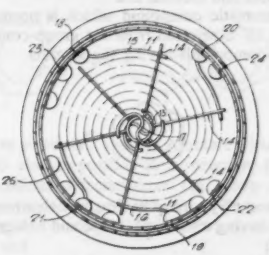


meters per second from a reactor antechamber and to pass into a mixing chamber which has inlet apertures for passage of said streams and their flow boundaries and one or more outlet ducts, in which mixing chamber the kinetic energy of the mixture is reduced to a value which is low in relation to its previously attained highest value and the portions of the mixture flowing in said mixing chamber are subjected to flow conditions which substantially vary at least periodically.

4,107,410
POLYMERIZATION COLUMN AND METHOD OF POLYMERIZING VINYLIDENE COMPOUNDS

Barna Toekes, Athol, Mass., assignor to Polysar Resins, Inc., Leominster, Mass.

Filed Apr. 22, 1977, Ser. No. 790,031
Int. Cl.² C08F 2/02, 2/04, 2/12, 12/06
U.S. Cl. 526—73 12 Claims



1. A polymerization column for polymerizing a monomeric vinylidene compound comprising a casing defining within it a polymerization chamber, a heat exchange means contained within the chamber, the heat exchange means comprising a series of heat exchange tubes which are spaced apart vertically of the chamber and each tube having a tube inlet and a tube outlet, a fluid ingoing tube length extending across the chamber in one directional sense from the tube inlet and a fluid return tube length which extends across the chamber in the opposite directional sense from the ingoing tube length to the tube outlet, and both tube lengths being in the form of wind-

ings to provide laterally spaced portions of each tube length with portions of one tube length being disposed laterally between spaced portions of the other tube length when considered in a radial plane of the chamber, and means to control the temperature of each tube.

4,107,411

METHOD OF PREPARING SALTS OF POLY-ALPHA-HYDROXYACRYLIC ACID

Julien Mulders, Dworp, and Jacques Gilain, Brussels, both of Belgium, assignors to Solvay & Cie., Brussels, Belgium

Continuation of Ser. No. 489,718, Jul. 18, 1974, abandoned. This application Oct. 15, 1975, Ser. No. 622,503

Claims priority, application Luxembourg, Jul. 18, 1973, 68037

Int. Cl.[2] C08F *2/10, 120/06*

U.S. Cl. 526—75 **24 Claims**

1. A process for preparing water-soluble salts of poly-α-hydroxyacrylic acid or its alkyl derivatives, comprising:

(a) thermally dehydrochlorinating, in the gas phase in the presence of a catalyst, α,β-dichloro-propionic acid, or its alkyl derivatives, to the corresponding α-chloro-acrylic acid;

(b) polymerizing the resulting α-chloro-acrylic acid in water in the presence of a free radical polymerization catalyst to obtain a solid product; and

(c) neutralizing the solid product with an aqueous solution of an alkali metal hydroxide or ammonium hydroxide.

4,107,412

OLEFIN POLYMERIZATION PROCESS AND CATALYST THEREFOR

M. Bruce Welch, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 24, 1976, Ser. No. 744,896

Int. Cl.[2] C08F *4/02, 10/06*

U.S. Cl. 526—114 **9 Claims**

1. A process which comprises polymerizing at least one aliphatic monoolefin having from 2 to 8 carbon atoms and no chain branching, at a polymerization temperature, with a catalyst system active for such polymerization consisting of:

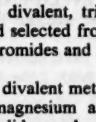
A. a first component formed of a co-comminuted mixture of

(1) a halogenated divalent, trivalent or tetravalent titanium compound selected from the group consisting of the chlorides, bromides and iodides thereof;

(2) a Lewis base;

(3) a dihalide of a divalent metal selected from the group consisting of magnesium and manganese, chlorides, bromides and iodides; and

(4) an aromatic compound which is normally liquid at about 25° C selected from the group consisting of aromatic compounds having the formula



wherein R is an alkyl group having 1 to 4 carbon atoms and n is an integer having a value of 0 to 4, and halogenated derivatives thereof;

B. a second component consisting of

1. at least one trialkylaluminum compound of the formula AlR'''_3, wherein R''' is an alkyl group having from 1 to 12 carbon atoms; and

2. a Lewis base; and

C. an optional third component which is a dialkylaluminum halide of the formula AlR''_2X, wherein R'' is an alkyl group having from 1 to 12 carbon atoms and X is a halide selected from the group consisting of chloride, bromide and iodide,

wherein the molar ratio of said halogenated titanium compound to said Lewis base is in the range of about 0.7:1 to about 1.6:1, said first component containing from 1 to 35 weight percent of said titanium compound, from 1 to 50 weight percent of said Lewis base, from 1 to 65 weight percent of said dihalide of magnesium or manganese and from 1 to 25 weight percent of said aromatic compound.

4,107,413

PROCESS FOR THE STEREOREGULAR POLYMERIZATION OF ALPHA OLEFINS

Umberto Giannini; Antonio Cassata; Paolo Longi, all of Milan, and Romano Mazzocchi, Pernate (Novara), all of Italy, assignors to Montedison S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 503,765, Sep. 6, 1974, abandoned, and Ser. No. 503,963, Sep. 6, 1974, abandoned, which is a continuation of Ser. No. 265,438, Jun. 23, 1972, abandoned, said Ser. No. 503,765, is a continuation of Ser. No. 265,503, Jun. 23, 1972, abandoned. This application Mar. 21, 1977, Ser. No. 779,739

Claims priority, application Italy, Jun. 25, 1971, 26275 A/71

Int. Cl.[2] C08F *4/02, 10/06*

U.S. Cl. 526—114 **34 Claims**

1. Process for the stereoregular polymerization of alpha-olefins of the formula $CH_2=CHR$ wherein R is an alkyl radical having 1–6 carbon atoms and mixtures thereof with ethylene, which process comprises polymerizing the olefins in contact with a catalyst the starting catalyst-forming components of which comprise the following components (A) and (B):

(A) the addition and/or substitution reaction product of an electron-donor compound (or Lewis base) free from ester groups of oxygenated organic and inorganic acids with an Al-trialkyl compound or the addition reaction product of said electron-donor compound with an Al-alkyl compound containing two or more Al atoms linked together through an oxygen or a nitrogen atom, component (A) being characterized in that the amount of Al-alkyl compound present as addition compound with the electron-donor compound ranges from 0.01 to 1 mole per mole of the starting Al compound and in that the Al-compound present as substitution compound ranges from 0.01 to 0.9 moles per mole of the starting Al-compound; and

(B) the product obtained by contacting a Ti compound selected from the group consisting of the halogenated bi-, tri-, and tetravalent Ti compounds and complexes of said Ti compounds with an electron-donor compound, with a support comprising an anhydrous Mg or Mn bihalide in an active state such that the X-rays powder spectrum of component (B) does not show the most intense diffraction lines as they appear in the X-rays powder spectrum of normal non-activated Mg or Mn bihalides, the X-rays powder spectrum of component (B) showing a broadening of said most intense diffraction lines, component (B) being further characterized in that the Ti compound present therein, expressed as Ti metal, is less than 0.3 g atom per mole of the total amount of the electron-donor compound present in a combined form in the catalyst and the catalyst being additionally characterized in that the Al/Ti molar ratio is from 10 to 1,000.

4,107,414

PROCESS FOR THE STEREOREGULAR POLYMERIZATION OF ALPHA OLEFINS

Umberto Giannini; Antonio Cassata; Paolo Longi, and Romano Mazzocchi, all of Milan, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

Continuation of Ser. No. 503,766, Sep. 6, 1974, abandoned, which is a continuation of Ser. No. 265,455, Jun. 23, 1972, abandoned. This application May 18, 1977, Ser. No. 798,151

Claims priority, application Italy, Jun. 25, 1971, 26275 A/71

Int. Cl.[2] C08F *4/02, 10/06*

U.S. Cl. 526—114 **37 Claims**

1. Process for the stereoregular polymerization of alpha-olefins of the formula $CH_2=CHR$ wherein R is an alkyl radical having 1–6 carbon atoms and mixtures thereof with ethylene,

which process comprises polymerizing the olefins in contact with a catalyst the starting catalyst-forming components of which comprise:

(a) an addition and/or substitution reaction product of an electron-donor compound (or Lewis base) selected from the group consisting of an ester of an oxygenated organic or inorganic acid with an Al-trialkyl compound or with an Al-alkyl compound containing two or more Al atoms linked together through an oxygen or a nitrogen atom, the amount of Al-alkyl compound contained in a combined form with the ester in catalyst-forming component (a) being from 0.05 to 1.0 mole per mole of the starting Al-compound; and

(b) the product obtained by contacting a Ti compound selected from the group consisting of halogenated bi-, tri-, and tetravalent Ti compounds and complexes of said Ti compounds with an electron-donor compound, with a support which comprises, as the essential support material thereof, an anhydrous bihalide of Mg or Mn in an active state such that the X-rays powder spectrum of component (b) does not show the most intense diffraction lines as they appear in the X-rays powder spectrum of normal, nonactivated Mg or Mn bihalide, the X-rays powder spectrum of component (b) showing a broadening of said most intense diffraction lines, and component (b) being further characterized in that the amount of Ti compound present therein, expressed as Ti metal, is less than 0.3 g-atom per mole of the total amount of the electron-donor compound present in a combined form in the catalyst and the catalyst being additionally characterized in that the Al/Ti molar ratio is from 10 to 1,000.

4,107,415
PROCESS FOR THE STEREOSPECIFIC POLYMERIZATION OF ALPHA-OLEFINS

Umberto Giannini; Antonio Cassatá; Paolo Longi, and Romano Mazzocchi, all of Milan, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

Continuation of Ser. No. 583,169, Jun. 3, 1975, abandoned, which is a continuation of Ser. No. 400,515, Sep. 25, 1973, abandoned. This application Mar. 18, 1977, Ser. No. 778,963
Claims priority, application Italy, Sep. 26, 1972, 29676 A/72
Int. Cl.[2] C08F *4/02, 10/06*
U.S. Cl. 526—114 **13 Claims**

1. In the process for the stereoregular polymerization of alpha-olefins of the formula $CH_2 = CHR$, in which R is an alkyl radical containing from 1 to 6 carbon atoms, which process comprises polymerizing the alpha-olefins in contact with a catalyst prepared by mixing

(a) a catalyst-forming component which is the addition and/or substitution product of an electron-donor compound (or a Lewis base) with an aluminum trialkyl, or the addition product of an electron-donor compound with an alkyl aluminum compound containing two or more aluminum atoms bound to one another through an oxygen or nitrogen atom, component (a) being characterized in that the organic aluminum compound combined with the electron-donor compound is comprised in the range from 0.01 to 1.0 mole per mole of the starting aluminum compound; with

(b) a supported catalyst-forming component which is the product obtained by contacting a substance selected from the group consisting of bi-, tri- and tetravalent titanium compounds selected from the group consisting of

$TiCl_4$;
$TiCl_3$;
TiI_4;
$Ti(OC_3H_7)Cl_3$;
$Ti(OC_4H_9)_2Cl_2$;
3 $TiCL_3$. $AlCl_3$;
$Ti[O—C(CH_3)=CH—CO—CH_3]_2Cl_2$;
$Ti[N(C_2H_5)_2]Cl_3$;
$Ti[N(C_6H_5)_2]Cl_3$;
$Ti(C_6H_5COO)Cl_3$;
$[N(C_4H_9)_4]_2TiCl_6$;
$[N(CH_3)_4]Ti_2Cl_9$;
$TiBr_4$;
$TiCl_3OSO_2C_6H_5$; and
$LiTi(OC_3H_7)_2Cl_3$,

and addition compounds of such titanium compounds with an electron-donor, with a carrier consisting of an anhydrous active magnesium or manganese dihalide both the carrier and component (b) being characterized by having a surface area larger than 3 m^2/g, or component (b) being characterized in thsat its X-rays powder spectrum does not show the diffraction lines which are most intense in the X-rays powder spectrum of the normal, non-active Mg or Mn dihalide, component (b) being further characterized in that the amount of Ti-compound present, expressed as Ti-metal, is less than 0.3 g-atoms per mole of the total amount of electrondonor compound present in combined form in the catalyst,

the improvement consisting of adding, to the anhydrous Mg or Mn dihalide, a solid organic co-carrier selected from the group consisting of durene, anthracene, hexachlorobenzene, p-dichlorobenzene, acenaphthene, naphthalene and diphenyl, in an amount of from 10% to 90% by weight based on the combined weights of the Mg or Mn dihalide and said solid organic co-carrier.

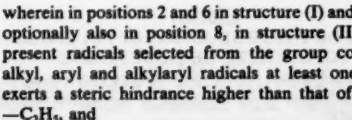
4,107,416
COMPONENTS OF CATALYSTS FOR USE IN POLYMERIZING AND CATALYSTS PREPARED THEREFROM

Umberto Giannini, Milan; Enrico Albizzati, Arona (Novara), and Sandro Parodi, Oleggio (Novara), all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Jul. 8, 1976, Ser. No. 703,546
Claims priority, application Italy, Jul. 9, 1975, 25217 A/75
Int. Cl.[2] C08F *4/02, 10/00*
U.S. Cl. 526—114 **7 Claims**

1. Catalysts for polymerizing olefins, prepared from the catalyst-forming components

(A) at least one organometallic compound of Al selected from the group consisting of R_2AlOR'' and $RAl(OR'')_2$ in which R is an alkyl group containing from 1 to 12 carbon atoms inclusive, and R'' corresponds to one of the following structures



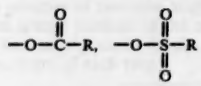
wherein in positions 2 and 6 in structure (I) and position 2, optionally also in position 8, in structure (II) there are present radicals selected from the group consisting of alkyl, aryl and alkylaryl radicals at least one of which exerts a steric hindrance higher than that of the group $—C_2H_5$, and

(B) a complex of a transition metal having the formula:

$$M_mM'X_{2m}Y.nE$$

wherein:

M is Mg, Mn and/or Ca;
m is a number from 0.5 to 2, inclusive;
M' is Ti, V and/or Zr;
X is Cl, Br or I;
Y is one or more atoms or groups, the same or different, and selected from the group consisting of halogen atoms, halogen atoms and, contemporaneously, oxygen atoms; $—NR_2$, —OR, —SR,



groups in which R is a hydrocarbon radical; acetylacetonate anion, acetylacetonate anion and, contemporaneously oxygen atoms; such groups or atoms being present in an amount to satisfy the valence of M';

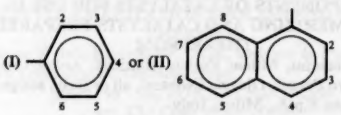
n is a number from 0.5 *m* to 20 *m*, inclusive;

E is an electron-donor compound selected from the group consisting of

(a) esters of organic carboxylic acids;
(b) alcohols;
(c) ethers;
(d) amines;
(e) esters of carbonic acid;
(f) nitriles; and
(g) phosphorous oxychloride and esters of phosphorous acid.

6. Catalysts for polymerizing olefins prepared from the catalyst-forming components:

(A) at least one organometallic compound of Al selected from the group consisting of R_2AlOR'' and $RAl(OR'')_2$ in which R is an alkyl group containing from 1 to 12 carbon atoms inclusive, and R'' corresponds to one of the following structures



wherein in positions 2 and 6 in structure (I) and position 2, optionally also in position 8, in structure (II) there are present radicals selected from the group consisting of alkyl, aryl and alkylaryl radicals at least one of which exerts a steric hindrance higher than that of the group $-C_2H_5$, and

(B) a solid component consisting of a transition metal, magnesium and a halogen selected from the group consisting of chlorine and bromine, said component being characterized in having a surface area higher than 3 m^2/g and/or in having an X-rays spectrum comprising a halo the intensity peak of which is at a lattice distance *d* comprised between 2.43 A and 3.20 A when the halogen is chlorine and present in said catalyst-forming component in a Cl/Mg ratio $\geqq 1$, and between 2.80 A and 3.25 A when the halogen is bromine and present in said catalyst-forming component in a Br/Mg ratio $\geqq 1$.

4,107,417

PROCESS FOR THE PRODUCTION OF POLYMERS AND COPOLYMERS OF ISOBUTYLENE

Aldo Priola; Sebastiano Cesca, and Giuseppe Ferraris, all of San Donato Milanese, Italy, assignors to Snamprogetti, S.p.A., Milan, Italy

Continuation of Ser. No. 307,498, Nov. 17, 1972, abandoned. This application Sep. 6, 1974, Ser. No. 503,600

Claims priority, application Italy, Nov. 26, 1971, 31726 A/71

Int. Cl.[2] C08F *4/64, 4/60, 210/12, 236/04*

U.S. Cl. 526—117 **5 Claims**

1. Process for the production of butyl rubber through the copolymerization of isobutylene and isoprene wherein the improvement comprises conducting the copolymerization reaction in the presence of a catalyst system consisting essentially of:

(a) a compound selected from $AlEtCl_2$, $TiCl_4$, $Al_2Et_3Cl_3$, $SbCl_5$, $FeCl_3$, $ZrCl_4$, AlI_3, $GaCl_2$; and

(b) a compound able to react with the above mentioned ones chosen from SrR_4, $TiX_2(OR)_2$, $Ti(OR)_4$, PbR_4, $Ti(OR)X_3$, $Ti(OR)_3X$, $(C_5H_5)_2Ti(C_6H_5)_2$, $(C_5H_5)_2$ $Ti(CH_3)_2$, $Ti(Acac)_4$, in which R is a hydrocarbon radical with from 1 to 10 carbon atoms; and X is an atom of halogen.

4,107,418

PROCESS FOR PREPARING COPOLYMERS

Tadao Yatsu, and Hiroshi Wakumoto, both of Iwakuni, Japan, assignors to Mitsui Petrochemical Industries Ltd., Tokyo, Japan

Filed Sep. 13, 1976, Ser. No. 722,499

Claims priority, application Japan, Sep. 18, 1975, 50-112170

Int. Cl.[2] C08F *4/28, 4/32, 4/34, 4/36*

U.S. Cl. 526—184 **4 Claims**

1. A process for preparing copolymers which comprises copolymerizing (a) at least one monomer selected from the group consisting of monoolefins, non-conjugated polyenes, conjugated polyenes, haloolefins, unsaturated esters of carboxylic acids and unsaturated ethers with (b) an acrylic monomer of the following formula

wherein R^1 is a member selected from the group consisting of a hydrogen atom, a halogen atom, a cyanide group, alkyl groups and aryl groups, and Y is a member selected from the group consisting of —CN, $—COR^2$, $—COOR^3$ and $—CONR^4R^5$ in which each of R^2, R^4 and R^5 is a hydrogen atom, or an alkyl, aryl or cycloalkyl group, and R^3 is an alkyl, aryl or cycloalkyl group or a monovalent metal, at a molar ratio of monomer (a) to monomer (b) of 1: to about 0.2 - 5, at a temperature ranging from about 0° C. to a point about 10° C, higher than the glass transition point of the resulting copolymer, with stirring, in the presence of a catalyst composed of (A) a component selected from the group consisting of (i) organoaluminum halides of the following formula

wherein R^6 is an alkyl, alkenyl, aryl, aralkyl or cycloalkyl group, X is a halogen atom, and n is a number of more than 0 but less than 3, and (ii) complexes formed between said halides (i) and organic polar compounds, and (B) an organic peroxide, in a poor solvent of a saturated hydrocarbon for the resulting copolymer, the amount of the poor solvent being about 0.5 to about 100 times the total amount of the monomers (a) and (b), wherein the copolymerization reaction is preformed while,

(I) adding the monomers (a) and (b) to the reaction system so that the total amount of the monomers (a) and (b) remaining unreacted in the reaction system is sufficient to maintain the system in the slurried state under the reaction conditions wherein said monomers unreacted are not more than about 2.5 moles per liter of the poor solvent used, and

(II) adding small portions of either one or both of the catalyst components (A) and (B) continuously or intermittently to the reaction system with the proviso that when only one of the catalyst components is added in small portions to the reaction system, the other catalyst component is added in its entirety to the reaction system before feeding the small portions of the other catalyst component,

(III) the amount of the catalyst component (A) being about 1/1,000,000 to about 1 mole, calculated as the organoaluminum halide (i) per mole of the monomers (a) and (b) combined and the amount of the catalyst component (B) being about 1/100 to about 100 moles per mole of the organoaluminum halide (i) in the catalyst component (A).

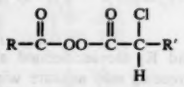
4,107,419
ALPHA HALO SUBSTITUTED ASYMMETRICAL DIACYL PEROXIDES IN CO-INITIATOR SYSTEMS

Ronald L. Friedman, deceased, late of San Rafael, Calif. (by Patty R. Friedman, executor), and Roger N. Lewis, Martinez, Calif., assignors to Argus Chemical Corporation, Brooklyn, N.Y.

Division of Ser. No. 739,416, Nov. 8, 1976. This application Mar. 4, 1977, Ser. No. 774,289
Int. Cl.² C08F *4/38, 14/06, 214/06*
U.S. Cl. 526—228 **18 Claims**

1. In the polymerization and copolymerization of vinyl chloride, polymerization of ethylene and polymerization of acrylates by subjecting said monomers and comonomers to polymerization conditions in the presence of an initiating amount of an organic peroxide, the improvement wherein said organic peroxide is a coinitiator composition comprising:

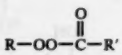
(a) an alpha halo substituted diacyl peroxide of the structure



where R = alkyl group of 1–11 carbon atoms
and R′ = alkyl group of 2–10 carbon atoms;
and

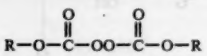
(b) a coperoxide selected from

(1) t-alkyl peresters of t-hydroperoxides of the structure



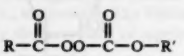
where R = t-alkyl of 4–20 carbon atoms
and R′ = t-alkyl of 4–20 carbon atoms

(2) peroxydicarbonates of the structure



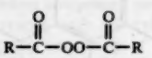
where each R — alkyl or cycloalkyl of 1–18 carbon atoms

(3) acyl peroxycarbonic esters of the structure



where R = alkyl or aryl of 1–11 carbon atoms
and R′ = alkyl or 1–18 carbon atoms

(4) aliphatic diacyl peroxides of the structure



where each R = alkyl of 2–11 carbon atoms, wherein the weight ratio of alpha halo substituted diacyl peroxide to coperoxide is about 3:1 to 1:3.

4,107,420
PROCESS FOR THE PREPARATION OF TERPENE-MALEIC ANHYDRIDE ADDUCTS

Robert William Schluenz, and Curry Beach Davis, both of Panama City, Fla., assignors to Arizona Chemical Company, Wayne, N.J.

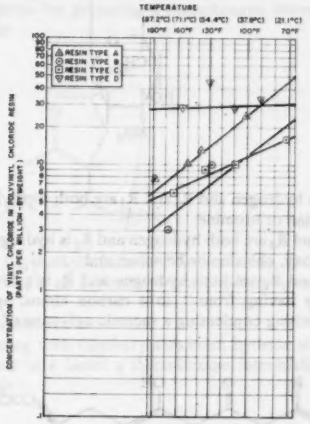
Division of Ser. No. 678,082, Apr. 19, 1976, Pat. No. 4,046,748. This application Apr. 18, 1977, Ser. No. 788,173
Int. Cl.² C08F *4/00, 222/04, 236/00*
U.S. Cl. 526—237 **7 Claims**

1. A process for preparing maleic anhydride adduct from non-conjugated terpenes which comprises: reacting at temperatures between 140° C. and 200° C. substantially equimolar amounts of (a) a non-conjugated terpene or mixed non-conjugated terpenes and (b) maleic acid anhydride in the presence of from 0.002% to 0.03% iodine, based on the weight of the terpene, and recovering a mixture of less than 85% monoadduct and more than 15% di-adduct of terpene maleic adducts.

4,107,421
REMOVAL OF VINYL HALIDE FROM POLYVINYL HALIDE

John F. Scamehorn, and David V. Porchey, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Aug. 13, 1976, Ser. No. 714,058
Int. Cl.² C08F *6/24, 6/00*
U.S. Cl. 528—483 **6 Claims**



1. A method of reducing the vinyl halide content of polyvinyl halide, in particle form, containing, vinyl halide, to a preselected level, wherein the method comprises:

(a) determining the threshold temperature corresponding to said preselected level of vinyl halide, and

(b) purging the polyvinyl halide containing vinyl halide, with an inert gas heated to a temperature of at least the determined threshold temperature until the vinyl halide content of the polyvinyl halide reaches said preselected level.

4,107,422
SOLVENT REMOVAL FROM POLYMER SOLUTIONS

Emigdio J. Salmon, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 2, 1977, Ser. No. 764,928
Int. Cl.² C08F *6/12, 6/10*
U.S. Cl. 528—502 **8 Claims**

1. In a process for removing solvent from a liquid mixture of polymer and solvent in which a liquid mixture is introduced into a devolatilizing extruder operated to volatilize at least a portion of the solvent in the liquid mixture in the extruder with cooling of the liquid mixture by circulating a cooling fluid in contact with the extruder barrel and removal of solvent vapor and at least partly devolatilized polymer from the extruder, the improvement of: controlling the surging of a motor driving the extruder by the amount of cooling of the liquid mixture.

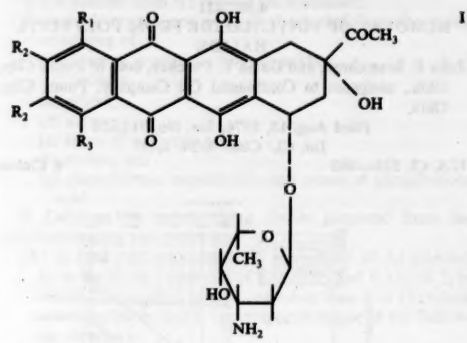
4,107,423

PROCESS FOR PREPARING DAUNOMYCIN AND ANALOGUES THEREOF

Federico Arcamone; Luigi Bernardi; Bianca Patelli, and Sergio Penco, all of Milan, Italy, assignors to Societa Farmaceutici Italia S.p.A., Milan, Italy

Filed Aug. 14, 1976, Ser. No. 695,434
Int. Cl.[2] C07H *15/24*
U.S. Cl. 536—4 5 Claims

1. A process for preparing a compound of formula I



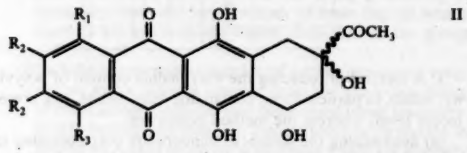
I

wherein

(a) R_2 is hydrogen and R_1 and R_3 are both methyl, methoxy, chlorine or bromine;

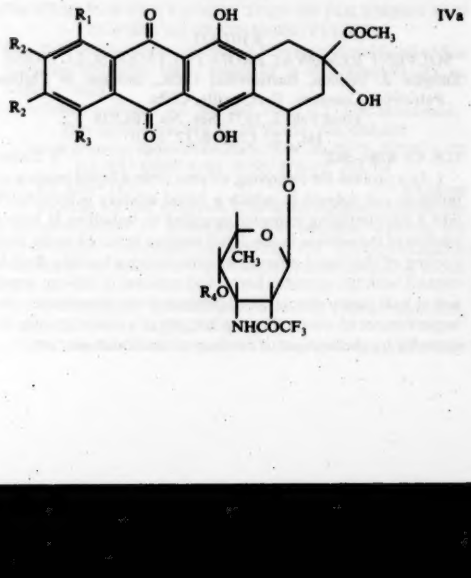
(b) R_1 and R_3 are both hydrogen and R_2 is hydrogen, methyl, methoxy, chlorine or bromine; and

(c) R_1 and R_2 are both hydrogen and R_3 is a lower alkoxy group having from 1 to 4 carbon atoms, said process comprising condensing a racemic aglycone of formula II:



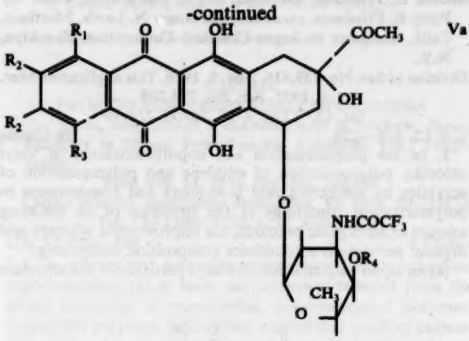
II

wherein R_1, R_2 and R_3 are as defined above, with 2,3,6-trideoxy-3-trifluoroacetamido-4-O-trifluoroacetyl-α-L-lyxo-pyranosyl chloride, in an aprotic solvent and in presence of an equimolecular amount of silver trifluoro-methane sulfonate in respect to the sugar compound, to give a mixture of the protected (7S : 9S)-α-glycosides (IVa) and (7R : 9R)-β-glycosides (Va):



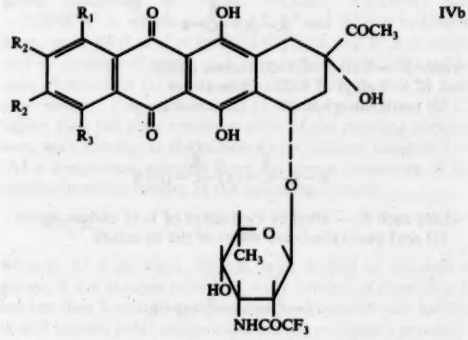
IVa

-continued

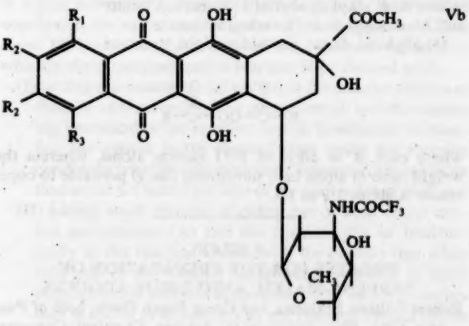


Va

wherein R_1, R_2 and R_3 are as defined above and R_4 is a $—COCF_3$ group, treating said mixture with methanol to remove the $—COCF_3$ group from the sugar moiety and thereby obtain a further mixture of the respective N-trifluoroacetyl derivatives of formulae IVb and Vb:



IVb



Vb

subjecting said further mixture to chromatography on a silica gel column using as the eluent therefor first chloroform and then a mixture of chloroform-acetone 95:5 (v/v), to obtain the (7S : 9S)-α-glycosides of formula IVb and then subjecting same to a mild alkaline hydrolysis at room temperature for about 30 minutes to thereby obtain a compound of formula I as the hydrochloride.

4,107,424

1-N-[(S)-α-HYDROXY-ω-AMINOACYL] DERIVATIVES OF 3',4'-DIDEOXYKANAMYCIN B AND 3'-DEOXYKANAMYCIN B ANTIBIOTICS

Hamao Umezawa; Sumio Umezawa; Kenji Maeda, all of Tokyo; Osamu Tsuchiya; Shinichi Kondo, both of Yokohama, and Shunzo Fukatsu, Tokyo, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

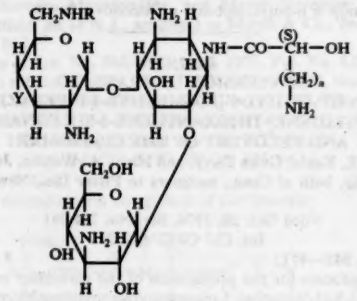
Continuation of Ser. No. 402,085, Oct. 1, 1973, Pat. No. 4,001,200. This application Jul. 23, 1976, Ser. No. 708,076

Claims priority, application Japan, Oct. 6, 1972, 47-99866; Oct. 19, 1972, 47-103988; Dec. 11, 1972, 47-123482; Jan. 23, 1973, 48-9146

Int. Cl.[2] C07H *15/22;* A61K *31/70*

U.S. Cl. 536—10 5 Claims

1. A compound of the formula:



wherein R is hydrogen or alkyl of 1–4 carbon atoms; Y is hydrogen or hydroxyl; *n* is 2 or 3; and the pharmaceutically acceptable acid addition salts thereof.

4,107,425

PREPARATION OF 1-α- AND 1-β-GLUCOSE ESTERS BY STEREOSELECTIVE ACYLATION OF METALATED 2,3,4,6,-TETRA-O-BENZYL-D-GLUCOPYRANOSE

Philip E. Pfeffer, Warrington, and Gordon G. Moore, Willow Grove, both of Pa., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Feb. 15, 1977, Ser. No. 768,916

Int. Cl.[2] C07H *13/02*

U.S. Cl. 536—119 5 Claims

1. A process for the preparation of anomerically pure 1-α- and 1-β-D-glucosyl esters comprising metalating 2,3,4,6-tetra-O-benzyl-D-glucopyranose with n-butyllithium in a solvent selected from the group consisting of tetrahydrofuran and anhydrous benzene, acylating the metalated product with an appropriate acid chloride, and hydrogenating the resultant acyl glucopyranose.

4,107,426

PROCESS FOR TREATING CELLULOSE

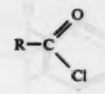
Roy Gerald Gordon, 22 Highland St., Cambridge, Mass. 02138

Filed Jul. 6, 1976, Ser. No. 702,534

Int. Cl.[2] A61F *13/16;* B32B *27/42*

U.S. Cl. 536—56 29 Claims

1. An article of manufacture comprising a sheet, pad or cloth of cellulose characterized in that at least one side thereof is water-repellent wherein said water-repellent side consists essentially of the reaction product of the cellulose with an aliphatic acid chloride in the vapor phase, said acid chloride having the general formula



wherein R is selected from straight-chain, branched-chain, or cyclic aliphatic hydrocarbon radicals having from about 6 to about 20 carbon atoms.

4,107,427

PROCESS AND INTERMEDIATES FOR PREPARING THROMBOXANE B_1

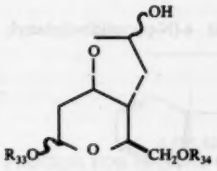
Robert C. Kelly, Kalamazco, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Aug. 20, 1976, Ser. No. 716,447

Int. Cl.[2] C07D *309/36, 309/38*

U.S. Cl. 542—427 14 Claims

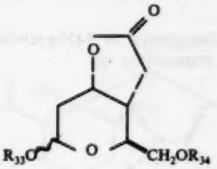
1. A process for preparing a thromboxane intermediate of the formula



wherein R_{33} is alkyl of one to 4 carbon atoms, inclusive; and wherein R_{34} is an arylmethyl hydroxy-hydrogen replacing group;

which comprises:

(1) reducing with diisobutylaluminum hydride at low temperature to a lactol a thromboxane intermediate of the formula



wherein R_{33} and R_{34} are as defined above.

4,107,428

DI-VINYL COLOR FORMERS

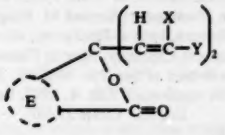
Sheldon Farber, Appleton, Wis., assignor to NCR Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 566,851, Apr. 10, 1975, Pat. No. 4,020,056. This application Apr. 25, 1977, Ser. No. 790,628

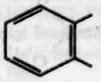
Int. Cl.[2] C07D *401/06, 401/14, 403/14*

U.S. Cl. 542—437 7 Claims

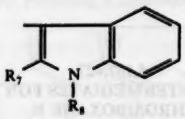
1. A compound represented by the formula:



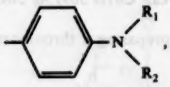
wherein E is tetrachloro- and tetrabromo-substituted



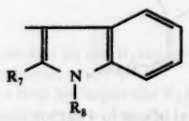
X is



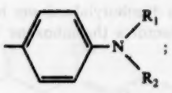
4-(N-piperidino)phenyl, and 4-(N-pyrrolidino)phenyl; Y is



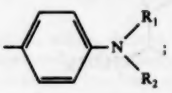
4-(N-piperidino)phenyl, and 4-(N-pyrrolidino)phenyl; provided when X is



Y is



and when X is 4-(N-piperidino)phenyl or 4-(N-pyrrolidino)-phenyl; Y is the same as X, respectively, or



and R_1, R_2, R_7 and R_8 are methyl, ethyl, N, propyl or N-butyl groups.

4,107,429

1-NOR-2-AMINO CARBAMATES DERIVED FROM ACID S, AN ANTIBIOTIC PRODUCED BY *POLYANGIUM CELLULOSUM* VAR. *FULVUM*

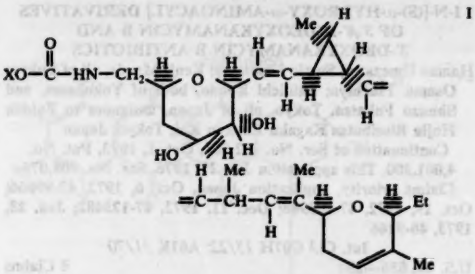
David T. Connor, Parsippany; Samuel M. Ringel, and Maximilian von Strandtmann, both of Rockaway, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 696,096, Jun. 14, 1976, abandoned. This application Feb. 4, 1977, Ser. No. 765,569

Int. Cl.[2] C09B *23/00*

U.S. Cl. 542—447 **11 Claims**

1. A compound having the formula I:



I

wherein X is lower alkyl with the proviso that the 4-carbon alkyl group is n-butyl, isobutyl or secondary butyl.

4,107,430

CONVERSION OF TRANS- TO CIS-N,N-DIMETHYL-9-[3-(4-METHYL-1-PIPERAZINYL)-PROPYLIDENE]-THIOXANTHENE-2-SULFONAMIDE AND RECOVERY OF THE CIS-ISOMER

Donald E. Kuhla, Gales Ferry, and Harry A. Watson, Jr., New London, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Oct. 20, 1976, Ser. No. 734,081

Int. Cl.[2] C07D *409/06*

U.S. Cl. 542—471 **8 Claims**

1. A process for the preparation of the cis-isomer of N,N-dimethyl-9-[3-(4-methyl-1-piperazinyl)propylidene]thioxanthene2-sulfonamide in isolated form which comprises the steps of contacting the trans-isomer with a base, selected from the group consisting of alkyl amines of from 3 to 12 total carbon atoms; cycloalkyl amines of from 4 to 18 total carbon atoms; lithium, sodium and potassium hydroxides, alkoxides of from 1 to 7 carbon atoms, and cycloalkoxides of from 4 to 10 carbon atoms; lithium, sodium and potassium salts of alkyl amines of from 3 to 12 total carbon atoms and cycloalkyl amines of from 4 to 18 total carbon atoms; and sodium amide, in solution in a reaction-inert polar organic solvent, in which solvent the solubility of the transisomer at a temperature of about −15° C. to 40° C. is at least about 1.25 times that of the cis-isomer, and separating precipitated cis-isomer from said solvent at said temperature.

4,107,431

Δ^3-3-VINYL OR SUBSTITUTED VINYL-4-CARBOXY CEPHALOSPORINS

John Colin Clark, Gerrards Cross, England; James Kennedy, Angus, Scotland; Alan Gibson Long, Greenford, and Niall Galbraith Weir, London, both of England, assignors to Glaxo Laboratories Limited, Greenford, England

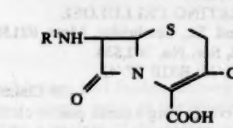
Continuation of Ser. No. 108,136, Jan. 20, 1971, abandoned. This application Jul. 8, 1974, Ser. No. 486,633

Claims priority, application United Kingdom, Jan. 23, 1970, 3436/70

Int. Cl.[2] A61K *31/545*

U.S. Cl. 544—16 **13 Claims**

1. A cephalosporin compound of the formula



wherein R^1 is an acyl group selected fromm the group consisting of

(a) R^2CH_2CO— where R^2 is thienyl; phenyl; phenyl substituted with fluoro, chloro, bromo, iodo, hydroxy, (C_1–C_6)

alkyl, nitro, amino, (C_1-C_6) alkanoyl, (C_1-C_6) alkoxy or (C_1-C_6) alkylmercapto; phenoxy; benzylthio; phenylthio; or 5-methyl-1,3,4-thiadiazol-2-ylthio,

(b) R^4.CO.CO- where R^4 is thienyl; phenyl; phenyl substituted with fluoro, chloro, bromo, iodo, hydroxy, (C_1-C_6) alkyl, nitro, amino, (C_1-C_6) alkanoyl; (C_1-C_6) alkoxy or (C_1-C_6) alkylmercapto; or naphthyl and

(c) $CN.CH_2CO$—

and R^3 is hydrogen or lower alkyl or a physiologically acceptable salt thereof.

4,107,432

7-DIACYLIMIDO CEPHALOSPORINS

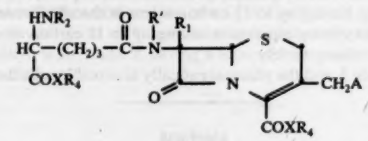
Burton G. Christensen; Lovji D. Cama, both of Metuchen; Sandor Karady, Mountainside, and Meyer Sletzinger, North Plainfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 565,495, Apr. 7, 1975, Pat. No. 4,058,661, which is a division of Ser. No. 356,873, May 3, 1973, abandoned, which is a continuation-in-part of Ser. No. 223,005, Feb. 2, 1972, abandoned, which is a continuation-in-part of Ser. No. 149,364, Jun. 2, 1971. This application Apr. 25, 1977, Ser. No. 790,793

Int. Cl.² C07D *501/32, 501/34*

U.S. Cl. 544—21 **7 Claims**

1. A cephalosporin compound of the formula:



wherein R_2 is hydrogen, trichloroethoxycarbonyl, t-butoxycarbonyl, trimethylsilyl, p-methoxybenzyloxy, 2-nitrophenylsulfenyl, 2,4-dinitrophenylsulfenyl, chloroacetyl, or o-nitrophenylthio;

X is oxygen or sulfur;

R_4 is hydrogen, methyl, ethyl, t-butyl, phthalimidomethyl, succinimidomethyl, phenacyl, p-bromophenacyl, 2,2,2-trichloroethyl, 2-methylthioethyl, 2-(p-methylphenyl)ethyl, methoxymethyl, 2-(p-methylphenyl)sulfonylethyl, 2-methylaminoethyl, benzyloxymethyl, p-methoxybenzyl, 3,5-dinitrobenzyl, 2-chloroethyl, 2-bromoethyl, benzyl, p-nitrobenzyl, 2,4,6-trimethylbenzyl, 3,5-dichloro-4-hydroxybenzyl, benzhydryl, p-methoxybenzhydryl, acetoxymethyl, pivaloyloxymethyl, methoxymethyl, phenyl, p-nitrobenzyl, or 3,5-dinitrophenyl;

R_1 is hydrogen or methoxy;

R′ is phenylacetyl, thienylacetyl, furylacetyl, phenoxyacetyl, phenylthioacetyl, α-azidophenylacetyl or trifluoroacetyl; and

A is hydrogen or acetoxy.

4,107,433

PHTHALIDYL ESTER OF 3-CARBOMOYLOXY CEPHALOSPORIN DERIVATIVES

Peter Hubert Bentley, Rudgwick, and John Peter Clayton, Horsham, both of England, assignors to Beecham Group Limited, England

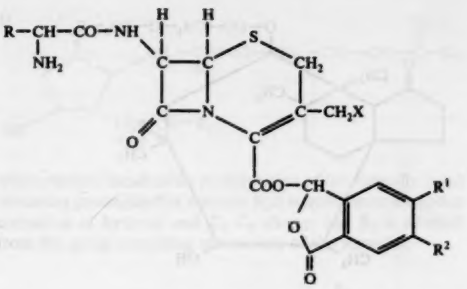
Division of Ser. No. 549,374, Feb. 12, 1975, abandoned. This application Dec. 29, 1976, Ser. No. 755,159

Claims priority, application United Kingdom, Feb. 21, 1974, 7860/74

Int. Cl.² C07D *501/30, 501/34*

U.S. Cl. 544—30 **3 Claims**

1. A cephalosporin ester of the formula:



or a pharmaceutically acceptable acid addition salt thereof wherein R is phenyl, 4-hydroxyphenyl, 3-chloro-4-hydrophenyl,

2- or 3-thienyl or dihydrophenyl;

X is carbamoyloxy; and

R^1 and R^2 are hydrogen or methoxy.

4,107,434

PROCESS FOR MAKING PLEUROMUTILINS

Erwin Waldvogel, Convent Station, N.J., assignor to Sandoz Ltd., Basel, Switzerland

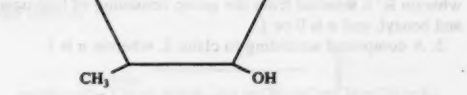
Filed Jan. 10, 1977, Ser. No. 757,858

Claims priority, application Switzerland, Jan. 15, 1976, 450/76

Int. Cl.² C07D *295/14*

U.S. Cl. 544—59 **7 Claims**

1. A process for the production of compounds of formula I,



I

in which *n* is 2, 3, 4 or 5,

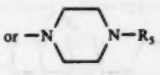
R_1 is ethyl or vinyl,

and either

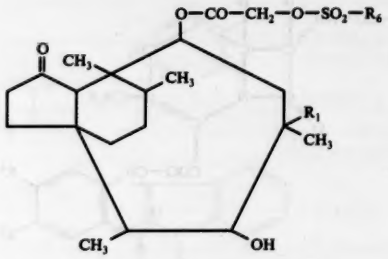
R_2 and R_3 are the same or different and each signifies alkyl of 1 to 4 carbon atoms,

or

R_2 or R_3, together with the nitrogen atom to which they are attached, is morpholino, thiomorpholino



where R_5 is methyl or ethyl, comprising reacting a compound of formula II,



II

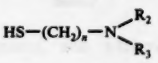
in which

R_1 is as defined above,

and

R_6 is alkyl of 1 to 4 carbon atoms or phenyl, unsubstituted or substituted by alkyl of 1 to 4 carbon atoms,

with a compound of formula III,



III

in which n, R_2 and R_3 are as defined above, characterized in that the reaction is effected under alkaline conditions in the presence of a phase transfer catalyst.

4,107,435

PROCESS FOR ω-AMINO-2-HYDROXYALKYL DERIVATIVES OF AMINOGLYCOSIDE ANTIBIOTICS

Barry C. Ross, Birchington, England, assignor to Pfizer Inc., New York, N.Y.

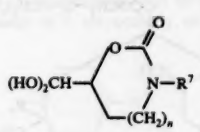
Filed Feb. 10, 1977, Ser. No. 767,657

Claims priority, application United Kingdom, Feb. 25, 1976, 7529/76

Int. Cl.² C07D *263/24, 265/06*

U.S. Cl. 544—97 **6 Claims**

1. A compound of the formula:



wherein R^7 is selected from the group consisting of hydrogen and benzyl, and n is 0 or 1.

2. A compound according to claim 1, wherein n is 1.

4,107,436

SUBSTITUTED N-(2-HYDROXYETHYL)MORPHOLINO CARBOXAMIDES

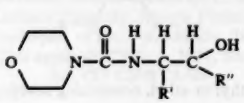
Shyam Sunder, and Norton P. Peet, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 624,365, Oct. 21, 1975, Pat. No. 4,052,385. This application May 27, 1977, Ser. No. 801,131

Int. Cl.² C07D *295/18*

U.S. Cl. 544—169 **5 Claims**

1. A N-(2-hydroxyethyl)cycloalkylaminocarboxamide having the formula



wherein R' and R'' are hydrogen, an alkyl group of from 1 to 4 carbon atoms, or phenyl.

4,107,437

2,3-DIHYDROBENZOFURANS

Jean-Pierre Maffrand, and Jean-Marie Pereillo, both of Toulouse, France, assignors to PARCOR, Paris, France

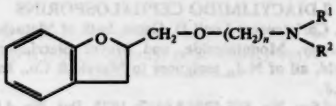
Filed May 2, 1977, Ser. No. 792,504

Claims priority, application France, May 31, 1976, 76 16370

Int. Cl.² C07D *405/12*

U.S. Cl. 544—376 **12 Claims**

1. 2,3-dihydrobenzo(b)furan of the formula



wherein

R^1 and R^2 each independently represent alkyl having 1–12 carbon atoms, phenyl alkyl wherein the alkyl moiety has 1–12 carbon atoms or together with the nitrogen atom to which they are attached form morpholino, phenylpiperazino, halophenylpiperazino, pyrrolidino, piperidino, trifluoromethylphenylpiperazino, alkyl phenyl piperazino, having up to 12 carbon atoms in the alkyl moiety or alkoxyphenylpiperazino having up to 12 carbon atoms in the alkoxy moiety;

n is 2 or 3; and the pharmaceutically acceptable salts thereof.

4,107,438

CYCLIC PHENYLSULPHINYL-AMIDINE DERIVATIVES

Victor Lafon, 76, avenue de la Republique, Paris, France

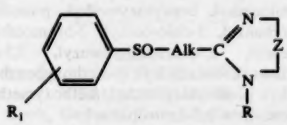
Division of Ser. No. 617,665, Sep. 29, 1975, Pat. No. 4,013,776. This application Jan. 18, 1977, Ser. No. 760,407

Claims priority, application United Kingdom, Sep. 30, 1974, 42387/74

Int. Cl.² C07D *233/22, 239/06*

U.S. Cl. 548—353 **8 Claims**

1. A phenylsulphinyl derivative of the formula:



in which R_1 is a substituent selected from the group consisting of H, F, Cl, Br, CF_3, C_1-C_4 alkyl, C_1-C_4 alkoxy and NO_2, Alk represents a C_2-C_4 hydrocarbon radical having a linear or branched chain, Z is selected from the group consisting of CH_2CH_2 and $CH_2CH_2CH_2$ and R is selected from the group consisting of H, CH_2COOH and $C(CH_3)_2COOH$ and non-toxic acid addition salts thereof.

4,107,439

PROCESS FOR PREPARING ARYLALKANOIC ACID DERIVATIVES

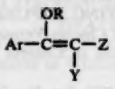
Jerry A. Walker, Osthemo Township, Kalamazoo County; David R. White, and William G. Salmond, both of Kalamazoo, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Jun. 16, 1976, Ser. No. 696,720

Int. Cl.² C07C *69/76, 65/00, 63/52*

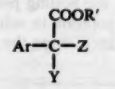
U.S. Cl. 560—55 **18 Claims**

1. A process which comprises reacting an enol ether of the formula



(III)

with trivalent thallium ions in an organic liquid containing at least one equivalent of an alcohol or water at a temperature of from about −25° C. to about reflux temperature of the mixture for a time sufficient to form a 2-aryl-C_3 to C_6-alkanoate ester of the formula



(I)

wherein in each formula

Ar is the aromatic moiety of a useful acid product containing from 6 to about 13 carbon atoms, in which the aryl ring portion of the aromatic moiety is a phenyl, phenoxyphenyl, naphthyl or biphenylyl group bonded to the carbon atom adjacent to the carboxyl ester moiety at an aryl ring carbon;

R is C_1 to C_4-alkyl, benzyl, phenyl, tris-(C_1 to C_3-alkyl)silyl; and R′ is equal to R or is an alkyl, benzyl, or phenyl group derived from the solvent medium;

Y and Z denote the residue of a C_3 to C_6-alkanoic acid moiety with each of Y and Z being hydrogen or C_1 to C_4-alkyl, with Y and Z having a total of from one to about 4 carbon atoms.

4,107,440

INTERMEDIATES FOR PREPARING SUBSTITUTED PHENYLGLYCYLCEPHALOSPORINS

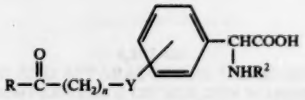
John Gerald Gleason, Cornwells Heights, Pa., assignor to Smith-Kline Corporation, Philadelphia, Pa.

Division of Ser. No. 641,064, Dec. 15, 1975, Pat. No. 4,044,047, which is a division of Ser. No. 384,771, Aug. 1, 1973, Pat. No. 3,953,439. This application Apr. 28, 1977, Ser. No. 791,770

Int. Cl.² C07C *149/437*

U.S. Cl. 560—17 **4 Claims**

1. A compound of the formula:



in which:

Y is S;

n is 1 to 5;

R is OR′, where R′ is lower alkyl of from one to four carbon atoms; and

R^2 is [hydrogen or]t-butoxycarbonyl.

4,107,441

NOVEL 16 HYDROXY 15-DEOXY-5-CIS-PROSTENOIC ACIDS AND ESTERS

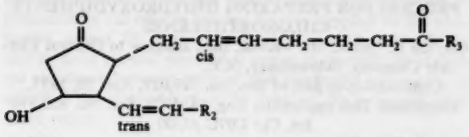
Middleton Brawner Floyd, Jr., Suffern, N.Y.; Martin Joseph Weiss, Oradell, N.J.; William James McGahren, Demarest, N.J., and Robert Eugene Schaub, Upper Saddle River, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 370,256, Jun. 15, 1973, abandoned. This application Aug. 26, 1975, Ser. No. 607,867

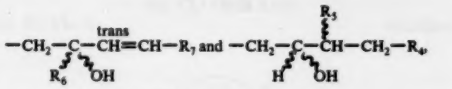
Int. Cl.² C07C *177/00*

U.S. Cl. 560—121 **62 Claims**

1. An optically active compound of the formula:

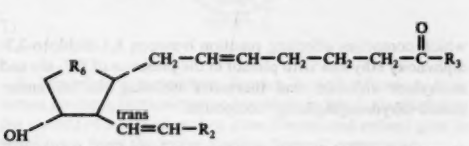


which depicts the absolute configuration of the naturally (nat.) occurring prostaglandins wherein R_3 is selected from the group consisting of hydroxy and C_1–C_5 alkoxy; and R_2 is selected from the group consisting of a moiety of the formula

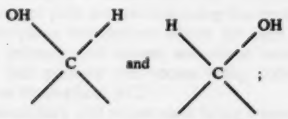


wherein R_4 is selected from the group consisting of C_1–C_4 alkyl and R_5 is selected from the group consisting of hydrogen and methyl and R_6 is selected from the group consisting of hydrogen and methyl and R_7 is selected from the group consisting of C_2–C_3 alkyl; with the proviso that when R_5 is methyl, then R_4 must be hydrogen; the racemic mixture thereof; the mirror image thereof; and the pharmacologically acceptable cationic salts thereof when R_3 is hydroxy.

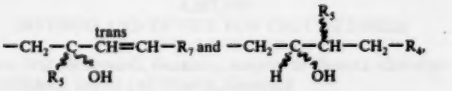
28. An optically acitve compound of the formula:



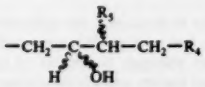
which depicts the absolute configuration of the naturally (nat.) occurring prostaglandins, wherein R_3 is selected from the group consisting of hydroxy and C_1–C_5 alkoxy; R_6 is selected from the group consisting of a moiety of the formula:



wherein R_2 is selected from the group consisting of a moiety of the formula



wherein R_4 is selected from the group consisting of C_1–C_4 alkyl and R_5 is selected from the group consisting of hydrogen and methyl and R_7 is selected from the group consisting of C_2–C_3 alkyl; with the proviso that when R_2 is



and R_5 is methyl, then R_4 must be hydrogen; the racemic mixture thereof; the mirror image thereof; and the pharmacologically acceptable cationic salts thereof when R_3 is hydroxy.

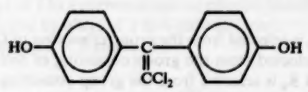
4,107,442

PROCESS FOR PREPARING DIHYDROXYDIPHENYL CHLOROETHYLENES

Clayton B. Quinn, Mt. Vernon, Ind., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 789,019, Apr. 20, 1977, abandoned. This application Aug. 18, 1977, Ser. No. 825,574
Int. Cl.[2] C07C 37/00
U.S. Cl. 568—726 1 Claim

1. The process for preparing the dihydroxydiphenyl compound, 1,1-dichloro-2,2-bis-(4-hydroxyphenyl)ethylene having the formula



which comprises effecting reaction between 1,1-dichloro-2,2-diphenoxy ethylene with phenol in the presence of BF_3 gas and methylene chloride, and thereafter isolating the aforementioned dihydroxydiphenyl compound.

4,107,443

PROCESS FOR PURIFYING IMPURE DIPHENOLS

Victor Mark, Evansville, and Charles Vernon Hedges, Mt. Vernon, both of Ind., assignors to General Electric Company, Pittsfield, Mass.

Filed Dec. 30, 1976, Ser. No. 755,983
Int. Cl.[2] C07C 37/22, 37/24
U.S. Cl. 568—750 12 Claims

1. A process for purifying impure p,p' diphenols which comprises dispersing the impure diphenol in water, heating the resulting slurry, adding a water soluble organic carboxylic acid co-solvent until the dissolution or near dissolution of the diphenol slurry results at or near the boiling point of water or the solvent system, cooling the solution to achieve the separation of the purified diphenol and recovering the purified p,p' diphenol.

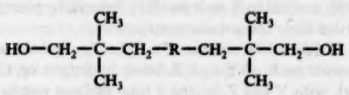
4,107,444

THERMALLY STABLE, RIGID, ALIPHATIC DIOLS

Elmore Louis Martin, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 16, 1976, Ser. No. 751,085
Int. Cl.[2] C07C 31/18
U.S. Cl. 568—807 8 Claims

1. Thermally stable, rigid, aliphatic diols of the forumla

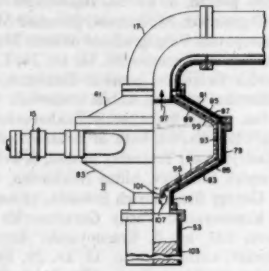


where R is an arylene selected from the group consisting of 1,4-phenylenes, 3,3'-biphenylenes, 4,4'-biphenylenes and 2,6-naphthylenes, said arylene being unsubstituted or substituted with halo, lower alkyl or phenyl.

4,107,445
TITANIUM AND ZIRCONIUM PRODUCTION BY ARC HEATER

Charles B. Wolf, Irwin, and Maurice G. Fey, Plum Borough, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 26, 1976, Ser. No. 745,726
Int. Cl.² H05H *1/00*
U.S. Cl. 13—2 P **10 Claims**

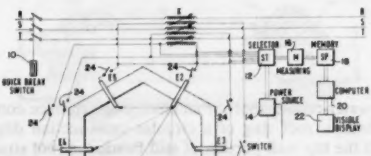


1. A high temperature reactor comprising a centrifugal chamber having a peripheral wall and opposite end walls, an inner wall substantially concentric with the peripheral wall and extending over and spaced from the opposite end walls, at least one arc heater extending from the chamber and through the inner and peripheral walls, the arc heater having a downstream outlet directed tangentially into the centrifugal chamber, the arc heater comprising a pair of axially spaced substantially cylindrical electrodes forming a narrow gap therebetween and adopted to be connected to a source of potential to produce an arc therebetween, the electrodes forming an arc chamber that communicates with the centrifugal chamber, gas inlet means communicating with the gap for introducing a non-conductive reducing gas into the arc chamber to form an arc heated gas stream, second inlet means communicating with the downstream outlet for introducing a quantity of a tetrahalide of a metal into the gas stream, third inlet means for introducing into the gas stream a quantity of one element selected from the group consisting of an alkali metal and an alkaline-earth metal, first vent means for lighter-weight products extending from the centrifugal chamber, and second vent means for heavier-weight products extending from the centrifugal chamber.

4,107,446
METHOD AND APPARATUS FOR MEASURING THE TEMPERATURE OF MOLTEN MASSES

Helmut Pieper, Lohr, Fed. Rep. of Germany, assignor to Sorg GmbH & Co. KG, Pflochsbach, Fed. Rep. of Germany

Filed Dec. 27, 1976, Ser. No. 754,871
Int. Cl.² C03B *5/02*
U.S. Cl. 13—6 **9 Claims**

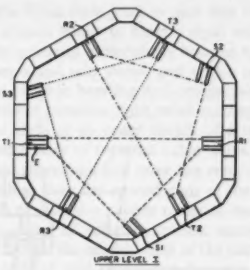


5. Apparatus for measuring the temperature or temperature distribution of an electrically conductive molten mass which is heated by electrodes receptive of heating current during use and immersed in the molten mass which comprises means to momentarily cut off the heating current supplied to the electrodes, means for passing measuring currents through the molten mass via said electrodes, means to measure the electrical resistance between paris of said electrodes and means to calculate the temperature of the basis of the measured resistance values.

4,107,447
ELECTRICAL GLASS MELTING FURNACE

Helmut Pieper, Lohr, Fed. Rep. of Germany, assignor to Sorg GmbH & Co. KG, Plochsbach, Fed. Rep. of Germany

Filed Jun. 7, 1977, Ser. No. 804,405
Int. Cl.² C03B *5/02*
U.S. Cl. 13—6 **8 Claims**



1. Electrical glass melting furnace having refractory tank means having a vertical center line wherein batch glass is fed to the surface of a bath of molten glass therein and refined glass is withdrawn from the lower portion thereof, comprising:

(i) at least two superposed levels of an integral multiple of nine electrode means extending into the molten glass and spaced around the periphery of the tank means; the uppermost level and the level therebelow each having sets of integral multiples of three electrodes with each set defining a current path not encompassing the center line;

(ii) a three-phase transformer means for each level, each having primary coil means and three secondary coil means, said primary coil means being connected to a source of three-phase AC;

(iii) said secondary coil means each being connected to one set of electrode means to provide both intraphase peripheral and cross firing current paths within each set of electrode means.

4,107,448
METHOD AND DEVICE FOR CRUCIBLE-FREE FLOATING ZONE MELTING

Hans Stut, Gröbenzell, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Continuation of Ser. No. 579,026, May 19, 1975, abandoned, which is a continuation of Ser. No. 186,618, Oct. 5, 1971, abandoned. This application Jul. 12, 1976, Ser. No. 704,639
Claims priority, application Fed. Rep. of Germany, Oct. 15, 1970, 2050076
Int. Cl.² B01J *17/08*
U.S. Cl. 13—26 **4 Claims**

2. Device for carrying out a method of automatically controlling crucible-free zone melting of a rod of semiconductor material supported by holders at opposite ends thereof, comprising a high frequency oscillating circuit including therein a high-frequency generator component, an inductive heater component for heating a molten zone formed in the rod, and a high-frequency cable fully matched during operation of the device and connecting said inductive heater component to said

4,107,448

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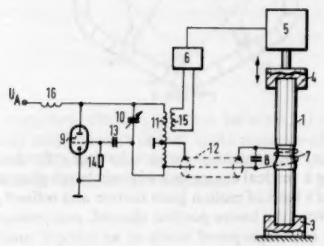
Claims priority, application Fed. Rep. of Germany, Oct. 15, 1970, 2050076
Int. Cl.[2] B01J *17/08*
U.S. Cl. 13—26 4 Claims



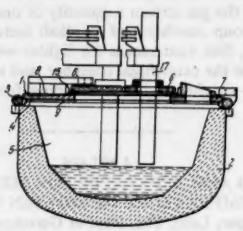
2. Device for carrying out a method of automatically controlling crucible-free zone melting of a rod of semiconductor material supported by holders at opposite ends thereof, comprising a high frequency oscillating circuit including therein a high-frequency generator component, an inductive heater component for heating a molten zone formed in the rod, and a high-frequency cable fully matched during operation of the device and connecting said inductive heater component to said high-frequency generator component, said high-frequency oscillating circuit oscillating with a frequency determined by the combined inductivity of said high-frequency generator component and said inductive heater component, said inductive heater component being inductively coupled to the molten zone of the rod, the inductive coupling thereof and the inductivity of said inductive heater being variable with varying volume of the molten zone whereby the oscillating frequency of the high-frequency oscillating circuit is dependent upon the volume of the molten zone, and means responsive to the oscillating frequency of the high-frequency oscillating circuit for adjusting the distance between the rod end holders so as to adjust the volume of the molten zone to a given value at which the high-frequency oscillating circuit oscillates at a predetermined frequency serving as a control criterion.

4,107,449

WATER-COOLED ROOF OF ELECTRIC-ARC FURNACE

Oleg Mikhailovich Sosonkin, ulitsa Chaikovskogo, 11, kv. 18; Leonid Savvich Katsevich, Sirenevy bulvar, 47, kv. 69, both of Moscow; Nikolai Alexeevich Pirogov, prospekt Lenina, 29, kv. 21, Elektrostal Moskovskoi oblasti; Zoya Mikhailovna Chistyakova, ulitsa Novocheremushkinskaya, 38, korpus 1, kv. 71; Viktor Alexandrovich Kudrin, ulitsa Krasnokazarmennaya, 12, korpus 1, kv. 32, both of Moscow; Jury Tikhonovich Borisov, Juzhny proezd, 3, kv. 30, Balashikha Moskovskoi oblasti; Oleg Evgenievich Molchanov, ploschad Metallurgov, 15, kv. 14, Cherepovets Volgogradskoi oblasti; Mikhail Vasilievich Savvin, ulitsa Kosmonavtov, 58, kv. 24, Lipetsk; Eduard Maximovich Grigoriev, poselok Remmash, 13, kv. 8, Zagorsk Moskovskoi oblasti; Alexei Ivanovich Fedchenko, ulitsa Michurina, 55, kv. 60; Anatoly Zakharovich Shevtsov, ulitsa Novaya, 149a, kv. 51, both of Krasnoyarsk; Valentin Semenovich Kudryavtsev, Teatralny proezd, 3, kv. 60, Belgorod; Ivan Kuzmich Silantiev, ulitsa Michurina, 63, kv. 20, Krasnoyarsk; Georgy Stepanovich Solomin, ulitsa Kutuzova, 162, kv. 53, Krasnoyarsk; Vasily Gerasimovich Mateshin, ulitsa Kutuzova, 122, kv. 6, Krasnoyarsk; Alexandr Mikhailovich Zinoviev, ulitsa Schorsa, 13, kv. 39, Krasnoyarsk; Viktor Iosifovich Shishiyannikov, ulitsa Michurina, 57, kv. 49, Krasnoyarsk; Gennady Mikhailovich Paly, ulitsa Parkovaya, 7, kv. 119, Odintsovo Moskovskoi oblasti; David Matveevich Koen, ulitsa Belomorskaya, 18, korpus 1, kv. 39, Moscow; Vladimir Vasilievich Seleverstov, ulitsa Ljusinovskaya, 53/12, kv. 21, Moscow; Jury Alexandrovich Smirnov, Teply Stan, 6 Mikroraion, korpus 113, kv. 163, Moscow, all of U.S.S.R.

Filed Sep. 20, 1976, Ser. No. 724,468
Int. Cl.[2] F27D *9/00*
U.S. Cl. 13—35 11 Claims



1. A water-cooled roof for an electric-arc furnace comprising: a hollow roof ring of a circular cross-section disposed adjacent the top wall portion of said furnace; a roof structure having side walls and a central hollow, disc portion and a circular, hollow peripheral ring portion, said central portion bearing through a circular gasket of an electric-insulating material on said peripheral ring portion which in turn bears on said roof ring; at least said central portion being provided with at least one through hole for the electrode of said furnace and at least said peripheral ring portion being provided with holes for the delivery of gases into the furnace and discharging

gaseous products; a refractory lining applied to the surfaces of said roof ring and said roof structure facing the interior side of the furnace space; and said roof ring, said central portion and said peripheral ring portion being in fluid flow connection with each other for circulating cooling water throughout said water-cooled roof.

4,107,450

REFRACTORIES AND METHODS OF MAKING SAME

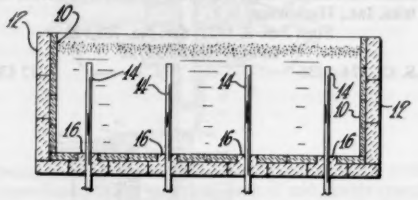
Darryl J. Costin, Columbus, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Division of Ser. No. 477,705, Jun. 10, 1974, Pat. No. 4,052,339. This application Mar. 17, 1977, Ser. No. 778,411

The portion of the term of this patent subsequent to Oct. 4, 1994, has been disclaimed.

Int. Cl.[2] C03B *5/02*; H01B *1/02*; H01C *1/02*

U.S. Cl. 13—35 **18 Claims**



2. An electric furnace having a heated chamber, said chamber having walls of a sintered refractory of low conductivity comprising: refractory particles having a crystalline lattice of metallic and non-metallic elements and which at elevated temperatures become an n-type or p-type semiconductor, and a purposeful addition of a dopant having an atomic radius sufficiently similar to that of the metallic lattice forming element that it diffuses into said lattice without forming deposits at the grain boundries between the particles and in an amount not appreciably exceeding the solubility of said dopant in said lattice to effectively alter the electrical conductivity of said crystalline lattice, said refractory being generally devoid of Group I and II fluxing elements at the grain boundries; and said particles being sintered together to form the refractory.

4,107,451

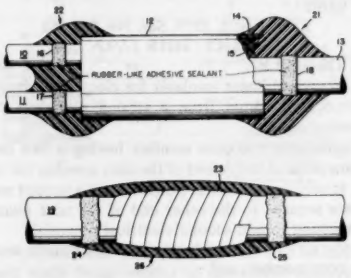
REINFORCED SPLICE JOINT AND METHOD OF MAKING SAME

Robert W. Smith, Jr., Kennett Square, and George C. Waite, West Chester, both of Pa., assignors to Trech, Inc., Coatesville, Pa.

Filed Nov. 19, 1975, Ser. No. 633,243

Int. Cl.[2] H02G *15/08, 1/14*

U.S. Cl. 174—84 R **10 Claims**



1. The method of making a permanent air tight splice joint between the spaced ends of a cable sheath comprising the steps of:

applying a sleeve over the area between the spaced ends of the cable sheath,

winding discontinuous strips of rubber like adhesive sealant to form sealant bands of continuous homogeneous rubber-like adhesive material around the spaced ends of the cable sheath,

preparing a filled resin containing a thixotropic agent, a bulk filler and fiber glass having a thick non-flowable putty-like consistency which becomes exothermic and shrinks upon curing and which is chemically compatible with the materials of the sleeve and sealant bands and will form a molecular bond therewith,

manually wiping the filled resin over said sealant bands, the ends of the cable sheath and the sleeve to form a built-up reinforced splice joint therebetween encapsulating said sealant bands,

permitting the filled resin joint to cure and shrink onto said adhesive sealant bands to form a rigid reinforced sealed splice joint partially molecularly bonded to said adhesive sealant bands and said sleeve and which is stronger than the parent cable in bending and compression.

10. A permanent pressure tight reinforced splice joint connecting spaced ends of an outer sheath of a telephone cable lying on opposite sides of repaired cable wires, comprising:

a rigid plastic sleeve applied over the repaired cable wires and extending over the spaced ends of the cable sheath,

sealant bands of adhesive rubber material, each being in the form of a string of adhesive sealant wound upon itself, wrapped around the spaced ends of the cable sheath adjacent the ends of said sleeve and forming tight adhesive bonds with said spaced ends of the cable sheath, and

a cured filled resin extending over the ends and opening of said sleeve and also encapsulating and sealing said adhesive sealant bands on said cable sheath under pressure, said cured filled resin containing chopped glass fibers, a thixotropic agent, a filler and a catalyst, and said cured filled resin being chemically compatible with said rigid plastic sleeve and said adhesive sealant bands and forming partial molecular bonds therewith.

4,107,452

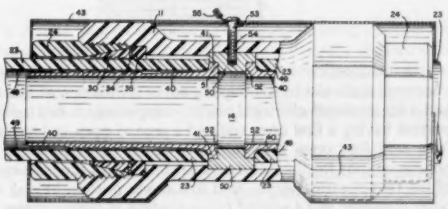
ELECTRICALLY CONDUCTIVE PIPE FITTING

Masood H. Razvi, 1889 Roberts St., Aurora, Ill. 60506

Filed Oct. 14, 1976, Ser. No. 732,378

Int. Cl.[2] F16L *11/12*

U.S. Cl. 174—84 S **15 Claims**



1. A coupling for joining two pipe segments each having an electrically conductive inner liner comprising, in combination:

a body including an open-ended bore extending through at least an end portion of respective ones of said pipe segments, the sidewall of said bore including a first pair of annular shoulder portions forming regions of increased diameter between said shoulder portions and the adjoining open end of said bore;

a pair of compression nuts each having an inside diameter substantially corresponding to the outside diameter of said pipe segments, an outside diameter substantially corresponding to said regions of increased diameter of said

bore, and a radially inwardly facing inclined inside surface, said compression nuts being threadedly engaged to said body at respective ends of said bore whereby said nuts are displaced inwardly along the axis of said bore when turned relative to said body;

a pair of grip rings disposed over said pipe segment within respective ones of said regions of increased diameter of said bore, said grip rings each including a gap in the circumference thereof, and each having an outside surface complimentarily radially outwardly inclined to the inclined inside surface of respective ones of said compression nuts and arranged in close relationship therewith,

means including a pair of generally sleeve-shaped stiffeners having diameters substantially corresponding to the inside diameters of respective ones of said pipe segments and extending along the interior passageway of respective ones of said pipe segments in electrical contact with the liners thereof from the open ends thereof for preventing deformation of the walls of said segments, and means including a pair of gaskets disposed over said pipe segment within respective ones of said regions of increased diameter of said bore for forming a seal between the outer surfaces of said pipe segments and the wall of said bore, said grip rings and said gaskets being radially compressed into engagement with the outer walls of respective ones of said pipe segments when said compression nuts are tightened; and

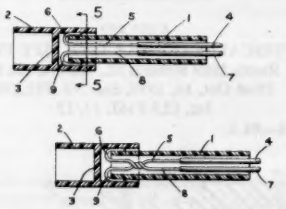
means including an electrically conductive collar disposed within said bore between the open ends thereof for engaging respective ones of said collars to form an electrical connection therebetween.

4,107,453

WIRES AND TWO-PART ELECTRICAL COUPLING COVER

Berthold Erixon, Gyttorp, Sweden, assignor to Nitro Nobel, Gyttorp, Sweden

Filed Aug. 2, 1976, Ser. No. 710,594
Claims priority, application Sweden, Sep. 2, 1975, 7509718
Int. Cl.[2] H01R *5/08;* B21F *7/00, 15/04*
U.S. Cl. 174—87 **2 Claims**



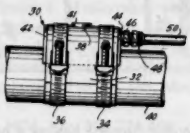
1. In combination, two insulated electrical wires each having a bare end and a electrical coupling cover for the connection of said two insulated electrical wires, comprising: a first cover portion having a first open end and a second open end spaced from said first open end, said first cover portion having a hollow interior for the insertion therethrough of the bare ends of the two electrical wires, said first cover portion having an outer diameter; and a second cover portion of similar shape as said first cover portion and comprising an open end and a transverse wall spaced from said open end of said second cover portion, said second cover portion also having a hollow interior defined by an inner diameter thereof, said inner diameter being slightly larger than said outer diameter of said first cover portion, said second open end of said first cover portion being inserted into said open end of said second cover portion, said transverse wall preventing the insertion of said first cover portion into said second cover portion past a certain point, said first cover portion being of the same cross-sectional dimension throughout the length thereof, said second cover portion also being of the same cross-sectional dimension throughout the length thereof, the inner and outer surfaces of each of said first and second cover portions being smooth throughout, the bare ends of the two electrical wires being inserted through said first cover portion toward said second open end of said first cover portion and made to extend therebeyond, at least one of the ends of said bare ends being bent over said second open end of said first cover portion onto the outer smooth surface thereof, the difference in diameter between the first and second cover portions being related to the diameter of the bent bare end of the wires such that with said first cover portion with said bare wire end bent thereover inserted into said inner surface of said second cover portion said bent end is clamped in place by said first and second cover portions so that upon rotation of said cover portions together, said two electrical wires are twisted together for electrical contact.

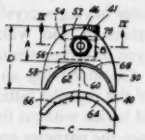
4,107,454

APPARATUS FOR PNEUMATICALLY COMMUNICATING WITH A PRESSURIZED CABLE

William Jakobsen, Northport, N.Y., assignor to Lourdes Industries, Inc., Hauppauge, N.Y.

Filed Jan. 3, 1977, Ser. No. 758,922
Int. Cl.[2] H02G *15/20*
U.S. Cl. 174—135 **17 Claims**





1. Apparatus for pneumatically communicating with a pressurized cable provided with a peripheral opening, said apparatus comprising a saddle of resilient material adapted to sit astride said cable in surrounding relationship with said opening, said saddle having two end faces and defining a concavity having a longitudinal axis, and a pneumatic fitting extending out of one of the end faces of said saddle in cantilever relation thereto and in generally parallel relationship with said axis, said saddle having a profile shielding said fitting.

4,107,455

LINEAR INSULATOR WITH ALTERNATING NONCONDUCTIVE SHEDS AND CONDUCTIVE SHIELDS

Clyde N. Richards, 4667 Ocean Blvd. Pacific Beach, San Diego, Calif. 92102

Filed Jun. 2, 1977, Ser. No. 802,661
Int. Cl.[2] H01B *17/42*
U.S. Cl. 174—140 R **10 Claims**

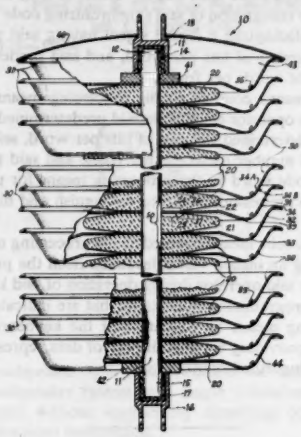
1. An improved linear insulator for electrically insulating a first electrical potential from a second electrical potential which comprises:

(a) a nonconductive core member having a first mounting means secured to one end of the core member for connecting to said first electrical potential and a second mounting means secured to the other end of the core member for connecting to said second electrical potential;

(b) a plurality of nonconducting sheds coaxially secured to the core member; and

(c) a plurality of conducting shields coaxially secured to the core member and alternatingly positioned with said sheds

so that each of said sheds is located intermediate two of said shields, the central portion of the upper surface of each of said sheds being in contact with the central portion of the shield immediately above said shed, and the central portion of the lower surface of each of said sheds



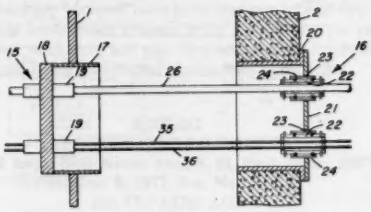
being in contact with the central portion of the shield immediately below said shed, each of said shields extending radially outwardly and downwardly then upwardly so that the outer perimeter of the shield is outside the shed immediately above said shields.

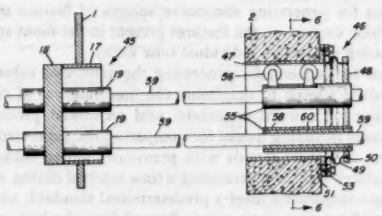
4,107,456

ELECTRICAL PENETRATION ASSEMBLY

Robert M. Schuster, and Norman G. Luria, both of San Jose, Calif., assignors to General Electric Company, San Jose, Calif.

Filed Sep. 27, 1976, Ser. No. 727,283
Int. Cl.[2] G21C *13/02, 13/04;* **H01B** *17/26*
U.S. Cl. 174—151 **11 Claims**





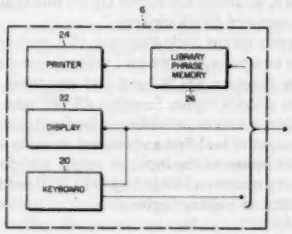
1. In a containment vessel having first and second spaced walls, said walls being subject to movement relative to one another, a penetration assembly to allow at least one electrical conductor to penetrate said containment vessel while maintaining the pressure and vapor integrity of the vessel, said penetration assembly including a first penetration subassembly fixed and sealed to said first wall comprising: a first tubular penetration nozzle sealed in said first wall, a first header sealed to one end of said first nozzle and having at least one first aperture, at least one first module sealed in said first aperture in said first header; and a second penetration subassembly in sliding engagement with and sealed to said second wall comprising: a second tubular penetration nozzle sealed in said second wall, a second header sealed to one end of said second nozzle and having at least one second aperture, at least one second module sealed in said second aperture, said first module and said second module each comprising a tubular body, at least one electrical conductor extending through said body and means for providing a vapor and pressure seal between said tubular body and said conductor, and said second penetration subassembly including means for accommodating relative movement between said conductor and said second wall to allow the unrestrained reaction of said conductor to relative movements between said first and second walls.

4,107,457

TRANSFER TERMINAL WITH LIBRARY PHRASE MEMORY

Thomas M. Hajduk, Torrance, Calif., assignor to TRW Inc., Los Angeles, Calif.

Filed May 23, 1977, Ser. No. 799,143
Int. Cl.[2] G11C *17/00;* **H04L** *13/08*
U.S. Cl. 178—17.5 **9 Claims**



1. A data transfer terminal of the type including a printer for printing out messages received from a remotely located data center, said data center providing different messages independently to a plurality of like data transfer terminals in a controlled data transfer system, said data transfer terminal being characterized by:

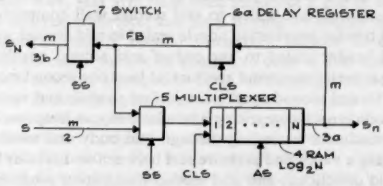
a library phrase memory containing a plurality of predetermined phrases at respective predetermined addresses in said library phrase memory, said addresses of said phrases corresponding respectively to a plurality of phrase address codes any of which may be included in a message sent by said data center to said transfer terminal, and

coupling control means, coupling said library phrase memory and said printer and responsive to messages received from said remotely located data center, for accessing from said memory the phrase stored at each address corresponding to a phrase address code included in said received message and for causing said printer to print out said accessed phrases, whereby the length of said message from said data center to be printed on said printer is greatly reduced in comparison with transmission from said data center of the full text to be printed.

4,107,458
CIPHER COMPUTER AND CRYPTOGRAPHIC SYSTEM

James N. Constant, 1603 Danbury Dr., Claremont, Calif. 90027

Filed Aug. 23, 1976, Ser. No. 716,679
Int. Cl.[2] H04L 9/02
U.S. Cl. 178—22 32 Claims



1. In a system for the implementation of a cipher computer and cryptographic system, the combination of:

a first memory means for storing a first signal S, said first memory means having storage locations for n words S_n;

a second memory means for storing a second signal K, said second memory means having storage locations for n words K_n;

crypto means having as input the stored outputs S_n, K_n of said first and second memory means and providing at its output the cipher product of said first and second signals, with said stored outputs S_n, K_n representing at least one of delayed, encrypted, and decrypted signals S, K and with said cipher product representing the cipher function $f(S, K) = S_n K_n$ where the subscript n indicates that n delay operations by said first and second memory means and n encrypting operations including at least one of multiplying, permuting and substituting by said crypto means have been performed on said first signal S using said second signal K to obtain the output cipher function $f(S, K)$ as one of stream and block ciphers,

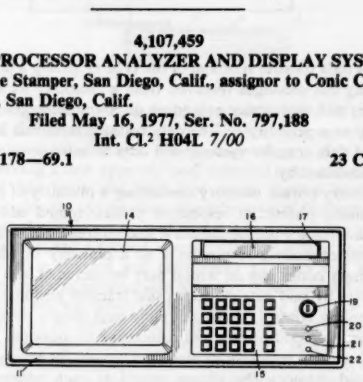
said crypto means including one of a multiplier and algorithm computer, where said multiplier encrypts a stream cipher function $f(S, K)$ and said algorithm computer encrypts a block cipher function $f(S, K)$; and

recirculation means providing a feedback path from one of the output of said first and second memory means and said crypto means to the input of one of said first and second memory means and including DELTIC feedback means in the form of a delay register.

4,107,459
DATA PROCESSOR ANALYZER AND DISPLAY SYSTEM

Jerry Lee Stamper, San Diego, Calif., assignor to Conic Corporation, San Diego, Calif.

Filed May 16, 1977, Ser. No. 797,188
Int. Cl.[2] H04L 7/00
U.S. Cl. 178—69.1 23 Claims



1. A system contained in a single console for distinguishing a digital signal in a received serial bit stream signal, wherein said bits represent data in an original digital signal having a predetermined bit rate, a predetermined number of bits per word, and a predetermined number of words per frame, with there being a predetermined synchronizing code word in each frame for defining said frame, comprising

processing means for processing said received signal to reconstruct said bits, to recognize said code word from said reconstructed bits, and to define said frames in response to recognition of said synchronizing code word, to thereby distinguish a digital signal having said predetermined number of bits per word, and said predetermined number of words per frame,

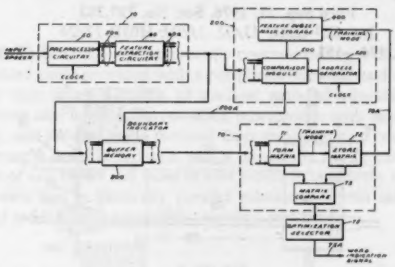
keyboard means coupled to the processing means for enabling an operator to indicate said predetermined bit rate, said predetermined number of bits per word, said predetermined number of words per frame and said predetermined code word to the processing means for programming the processing means to distinguish said digital signal; and

cathode ray tube means coupled to the processing means for providing an instant visual feedback from the processing means to said operator during operation of said keyboard, of said programming indications that are indicated to the processing means by operation of the keyboard means, and for providing a visual display of data represented by said distinguished digital signal.

4,107,460
APPARATUS FOR RECOGNIZING WORDS FROM AMONG CONTINUOUS SPEECH

Gene Grunza, Blackwood, and Marvin B. Herscher, Cherry Hill, both of N.J., assignors to Threshold Technology, Inc., Delran, N.J.

Filed Dec. 6, 1976, Ser. No. 747,827
Int. Cl.[2] G10L 1/00
U.S. Cl. 179—1 SD 24 Claims



1. Apparatus for recognizing the occurrence of a command word from among input speech that may be of continuous form, comprising:

means for generating successive subsets of feature signals which depend on the features present in the input speech during successive individual time slots;

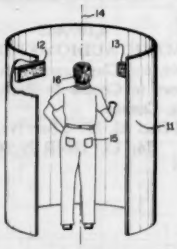
means for sequentially processing the generated subsets of feature signals to determine the time interval of occurrence of a word candidate, said sequential processing means including means for comparing the generated subsets of feature signals with previously stored subsets of features and for determining a time interval during which the comparisons meet a predetermined standard; and

means for comparing a matrix formed from the feature subset signals which occurred during the determined interval with a previously stored matrix of features that are expected to occur characteristically during the command word, and for generating an occurrence indication when the comparison meets another predetermined standard.

4,107,461
ENVIRONMENT FOR DEMONSTRATING A STEREO LOUDSPEAKER SYSTEM

Amar G. Bose, Wayland, Mass., assignor to Bose Corporation, Framingham, Mass.

Filed Jun. 9, 1977, Ser. No. 804,896
Int. Cl.[2] H04R *5/02*
U.S. Cl. 179—1 GA **5 Claims**



1. A loudspeaker system environment for demonstrating a stereo loudspeaker system to a single individual inside said environment without appreciably disturbing others outside said environment comprising,

first and second loudspeaker systems comprising said stereo loudspeaker system,

means defining an acoustic enclosure for supporting said first and second loudspeaker cabinets at a height corresponding substantially to the head of a listener and pointing toward the axis of said enclosure,

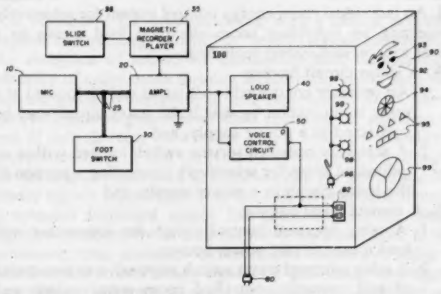
said enclosure having a span greater than the span of said first and second loudspeaker systems and sufficiently great to accommodate a person on said axis with its perimeter embracing at least substantially slightly less than a semicircle and embracing sufficiently less than a circle to provide an opening greater than the width of a person for providing easy entry to a person while providing good stereo sound reception along said axis at said head height while providing significantly less sound intensity outside said enclosure,

the separation between outermost portions of said first and second loudspeaker systems being greater than the radius of said semicircle and said first and second loudspeaker systems being substantially inside said semicircle.

4,107,462
ELECTROVENTRILOQUIST

Satya Pal Asija, 2015 Butler Ave., S. St. Paul, Minn. 55075

Filed Jun. 9, 1977, Ser. No. 805,140
Int. Cl.[2] A63H *3/33*
U.S. Cl. 179—1 VC **3 Claims**



1. An electroventriloquism apparatus comprising:

(a) a throat microphone;

(b) an amplifier connected to said throat microphone;

(c) a normally closed momentary foot switch connected to said throat microphone and said amplifier so as to normally short circuit the input to said amplifier;

(d) a loudspeaker connected to said amplifier;

(e) a voice modulated control circuit connected to the output of said amplifier; and

(f) plurality of lights and electromechanical devices powered via said voice actuated control circuit; and wherein said voice actuated control circuit comprises:

(g) an input plug;

(h) an output socket connected in series with said input plug;

(i) a diode bridge rectifier with its alternating current terminals connected across said series combination of said input plug and said output socket;

(j) a silicon controlled rectifier with its anode connected to positive direct current terminal of said diode bridge rectifier and its cathode connected to negative direct current terminal of said diode bridge rectifier;

(k) a coupling transformer with its primary terminals connected to said loudspeaker and one of secondary terminals connected to said cathode of said silicon controlled rectifier and the other secondary terminal connected to gate of said silicon controlled rectifier via a capacitor and a first resistor; and

(l) a second resistor connected to said cathode of said silicon controlled rectifier and the junction of said capacitor and said first resistor; and wherein:

(m) a magnetic tape recorder cum player pre-recorded with machine part of the dialogue is connected to another input of said amplifier; and

(n) a slide switch is connected in series with the power supply of said magnetic tape recorder cum player.

2. A process of debating with an electroventriloquism apparatus of this invention comprising the steps of:

(a) connecting a microphone in the vicinity of the human ventriloquist;

(b) sensing the audio from the microphone without lip movement of the human ventriloquist;

(c) amplifying the audio via an amplifier;

(d) short circuiting the output of said microphone during the human part of the dialogue;

(e) placing a loudspeaker connected to said amplifier within said electroventriloquism apparatus;

(f) modulating the lights and other electromechanical devices as a function of said amplifier output;

(g) pre-recording certain sounds on a tape recorder;

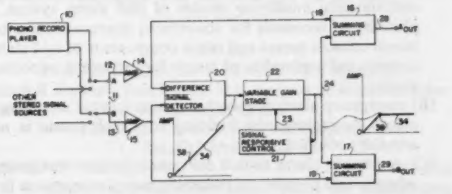
(h) open circuiting the power to said tape recorder during the machine part of the dialogue and during special sound effects; and

(i) controlling strobe rate of lights.

4,107,463
STEREOPHONIC NOISE SUPPRESSION SYSTEM

Edward E. Pearson, 220 Highland Dr., Lafayette, La. 70506

Filed Jul. 6, 1977, Ser. No. 813,179
Int. Cl.[2] H04R *5/00*
U.S. Cl. 179—1 G **10 Claims**



1. In a stereophonic reproduction system, the combination comprising, two separate reproduction channels for providing

stereophonic output signals A and B from two separate input signal sources, third channel means for deriving the difference signal (A-B) between the two input channels,

variable gain means including control means for varying the magnitude of the difference signal to provide a linear transfer characteristic up to a predetermined input amplitude and essentially constant amplitude for input amplitudes higher than the predetermined input amplitude,

signal responsive control means operable with said variable gain means to control the gain by feedback path from the output of said variable gain means,

and means summing the output of said variable gain means into each of said two reproduction channels in proper phase that the signal in each channel respectively is reduced in the same proportion as the signal from the opposite channel is added,

thereby to provide two output signal channels in which oppositely phased signal content for amplitudes below said predetermined input amplitude is reduced as a function of the difference signal A-B, and wherein the averaged output from channels A and B remains constant for monaural input signal components regardless of the degree of control by the third channel.

4,107,464

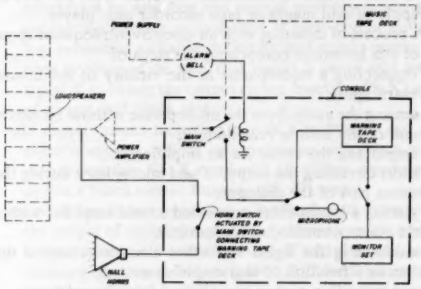
ALARM COMMUNICATIONS SYSTEM

John H. Lynch, 501 Amethyst St., New Orleans, La. 70124, and George L. Gallegos, 513 Harang, Metairie, La. 70001

Continuation of Ser. No. 608,238, Aug. 27, 1975, abandoned. This application Jul. 26, 1977, Ser. No. 819,089

Int. Cl.[2] H04R *27/00*

U.S. Cl. 179—1 B **1 Claim**



1. An alarm system for a high-rise building having a pre-installed non-verbal fire alarm system with at least one master alarm switch, and a pre-installed music transmitting system which includes a music source, amplifier and a plurality of loudspeakers, whereby the alarm system can be simply and conveniently installed to incorporate the pre-installed systems, the alarm system comprising:

(A) a console means comprising a tape unit with recorder-playback means with pre-recorded alarm verbal messages, a microphone, a monitor for the tape unit, a plurality of switching means comprising manual and relay means for operationally modifying modes of said alarm system, a plurality of terminals for convenient interconnection between console means and other components of said alarm system, and a plurality of lamps for indicating operating mode,

(B) emergency alarm speakers or horns located at strategic places throughout the building to which music is not normally coupled, and

(C) A remote alarm switch for manual alarm instigation, wherein said plurality of switching means comprise: a first relay which provides connection of the music source to the amplifier and loudspeakers in the non-alarm mode; a second relay which responds to the master alarm switch to cause a third relay to interconnect the tape unit to the amplifier and loudspeakers; a fourth relay which responds to the remote alarm switch to interconnect the tape unit to the amplifier and loudspeakers; a fifth relay which responds to a microphone switch to connect the microphone to the amplifier and loudspeakers; a sixth relay which energizes the tape unit, and a seventh relay which responds to a horn switch to connect the horn speakers and lamp indicators to their respective energy sources.

4,107,465

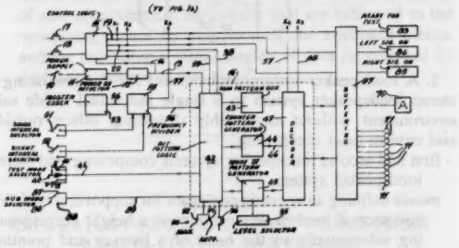
AUTOMATIC AUDIOMETER SYSTEM

Jacques Charlebois, and Guy Lescouflair, both of Sainte-Foy, Canada, assignors to Centre de Recherche Industrielle du Quebec, Quebec, Canada

Filed Dec. 22, 1977, Ser. No. 863,238

Int. Cl.[2] H04R *29/00*

U.S. Cl. 179—1 N **20 Claims**



1. An audiometer for testing the hearing of a person, said audiometer comprising a source of audible and selectable fixed frequency signals, frequency selector means for selecting a predetermined frequency signal from said source, a variable attenuator circuit having a plurality of attenuation levels for automatically attenuating said predetermined frequency signal through said attenuation levels and according to a preselected mode of operation for transmission of a plurality of attenuated frequency signals, means to transmit said attenuated frequency signals for audible reception by said person, visual display means to indicate the transmission of each of said attenuated frequency signals, and control circuit means for enabling said frequency selector means and said variable attenuator in accordance with said preselected mode of operation.

4,107,466

INDIVIDUAL ROOM ENERGY CONTROL SYSTEM

Steven T. Churchill, Wilton, Conn., assignor to Letot, Incorporated, Fairfield, Conn.

Filed Aug. 16, 1976, Ser. No. 714,848

Int. Cl.[2] H04M *11/00*

U.S. Cl. 179—2 A **4 Claims**

1. An individual room energy control system for selectively connecting an individual room electrical load means to a power source, said system including:

A. A status circuit having:

1. An operator controlled room status switch located at a room status station by which the status circuit may be connected to a power supply, and

2. A manually operated service switch located within an individual room for selectively connecting a portion of the status circuit to a power supply, and

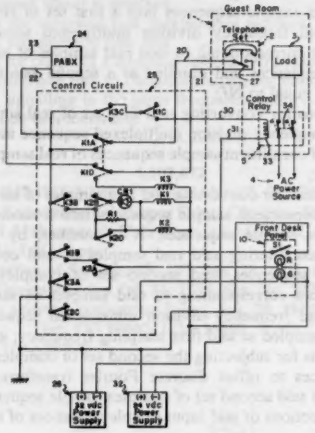
B. A control ciruit having:

1. A relay operated control switch for connecting said load means to said power source,

2. A relay operated status switch responsive to movement of said operator controlled room status switch and energization of said status circuit for connecting said control circuit to a power supply and causing said relay

operated control switch to disconnect said load means from said power source, and

3. A relay operated service switch responsive to move-



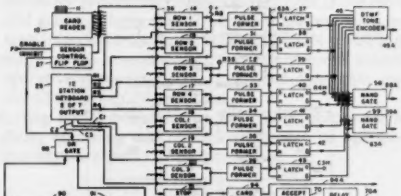
ment of said manually operated service switch for disconnecting said control circuit from said power supply and whereby said relay operated control switch will move to connect said load means to said power source.

4,107,467

ELECTRONIC ORDER PLACEMENT SYSTEM USING SIGNALS OVER TELEPHONE LINE

Clifford Carl Johnson, Arlington Heights, Ill., and Vincent Elliott Eitzen, Marco Island, Fla., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Jun. 9, 1977, Ser. No. 804,884
Int. Cl.[2] H04M *11/00*
U.S. Cl. 179—2 DP **13 Claims**



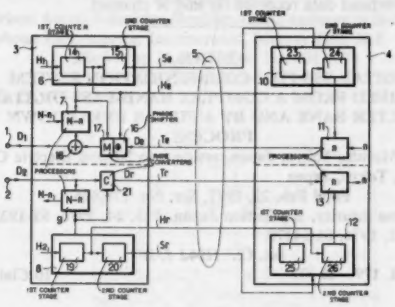
1. Apparatus for communicating with a central processor capable of returning "accept" or "reject" signals responsive to the reception of subsets of transmitted data, comprising: a plurality of order cards forming a card order deck, each card bearing machine-interpretable data representative of a known item and including an End-of-Card character for signaling the end of data thereon; card reader means holding a plurality of preselected ones of said cards and responsive to a feed signal for reading the next card in sequence and for generating first binary signals representative of the data on said card; manually-actuated keyboard means for generating second binary signals representative of data desired to be transmitted to said processor; tone generator circuit means responsive either to said first and second binary signals for generating tone signals representative thereof; acoustic coupler means receiving said tone signals for transmitting the same to a telephone line; first detector means responsive to an "accept" signal from said processor for generating a feed signal to said card reader means to read the next card; second detector means responsive to a "reject" signal from said processor for inhibiting said card reader means from reading said next card; first logic circuit means for controlling the generation of said feed signal to said card reader; detector circuit means for detecting an End-of-Card character being read by said card reader means; timer circuit means for delaying the output of said first detector means for a time sufficient to insure transit of said card being read from said card reading station; and said first logic circuit means being responsive to the output of said timer circuit and to an "accept" signal from said processor for generating said feed signal, whereby said feed signal will be inhibited if an End-of-Card signal is not detected or if an "accept" signal is not received from said processor.

4,107,468

DIGITAL TRAIN PROCESSING DEVICE

Gilles Gauriat, Paris; Jacques Vernezy, Viroflay, and Jean-Claude Barigot, Brie Comte Robert, all of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel S.A., Paris, France

Filed Oct. 14, 1976, Ser. No. 732,440
Claims priority, application France, Oct. 20, 1975, 75 32057
Int. Cl.[2] H04J *3/12*
U.S. Cl. 179—15 BY **5 Claims**



1. A device for processing a digital pulse train composed of N-bit frames, said device comprising a main unit, an auxiliary unit and a cable connecting both units, said main unit comprising a main processor for processing N-*n* bits per frame and a modulo N counter, which counts at the bit rate of the train and which defines by its instantaneous state the position of a bit in the frame, said auxiliary unit comprising an auxiliary processor for processing at least some of the remaining bits of each frame and an auxiliary modulo N counter of the same type as the main counter, which receives via the cable a submultiple *n*/N of the bit rate of the train, said submultiple being applied to an intermediate stage of the auxiliary counter such that part of this counter counts at the same rate as the corresponding part of the main counter, said auxiliary counter including means for synchronizing the operation of the auxiliary processor and the information exchange with the main unit via the cable.

4,107,469

MULTIPLEX/DEMULTIPLEX APPARATUS

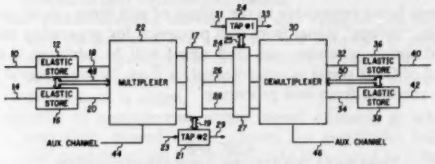
James R. Jenkins, Fort Worth, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 17, 1977, Ser. No. 769,494
Int. Cl.[2] H04T *3/18*
U.S. Cl. 179—15 BW **7 Claims**

1. A multiplexing communication system for transmitting two given data rate sources on three lower data rate communication channel means before demultiplexing to two channels at the data sink comprising, in combination:

first and second means for supplying first and second channels of data respectively at given substantially identical data rates;

multiplexing means, connected to said first and second means, for interleaving incoming data consecutively on X, Y, and Z data channel output means with overhead data bits used for demultiplexing wherein only said X output means includes said overhead data bits and each of said channels operate at lower data rates than said given data rate;



transmission means; and

demultiplexing means, interconnected by said transmission means for receiving signals from said X, Y, and Z output means of said multiplexing means, including frame bit synchronizer means operating at the rate of said incoming X channel for demultiplexing to two output data channels operating at said given data rates in accordance with overhead data received on said X channel.

4,107,470
DIGITAL SSB-FDM COMMUNICATION SYSTEM DERIVED FROM A COMPLEX BAND-PASS DIGITAL FILTER BANK AND BY A FILTER BREAKDOWN PROCESS

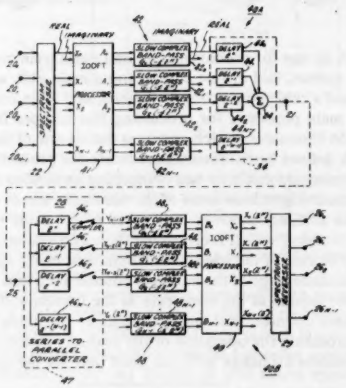
Rikio Maruta, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Feb. 22, 1977, Ser. No. 770,426

Claims priority, application Japan, Feb. 24, 1976, 51-19328; May 12, 1976, 51-54179

Int. Cl.² H04J *1/18*

U.S. Cl. 179—15 FS **10 Claims**



1. A single side-band frequency division multiplexed communication system for input sample sequences of real samples derived with a first sampling frequency f_s from baseband channel signals, respectively, of a plurality of baseband channels, N in number, said baseband channels including a predetermined number of dummy baseband channels, said predetermined number being less than N, each of said baseband signals having a bandwidth equal to or less than $f_s/2$, said communication system comprising:

first means for subjecting said sample sequences of real samples to offset discrete Fourier transformation to convert said sample sequences into a first set of complex sample sequences, N in number;

second means for digitally band-pass filtering said first set of complex sample sequences into a first set of real single side-band frequency division multiplexed sequence of samples corresponding to said real samples of said input same sequences and sampled at a second sampling frequency equal to Nf_s;

third means for converting said first set of real single side-band frequency division multiplexed sequence into a plurality of constituent sample sequences of real samples, N in number;

fourth means for converting said real samples of said plurality of constituent sample sequences into a second set of complex sample sequences, N in number, by digitally band-pass filtering said real samples of said constituent sample sequences, said second set of complex sample sequences corresponding to said samples of said single side-band frequency division multiplexed sequence and being sampled at said first sampling frequency; and

fifth means for subjecting the second set of complex sample sequences to offset discrete Fourier transformation to convert said second set of complex sample sequences into reproductions of said input sample sequences of real samples.

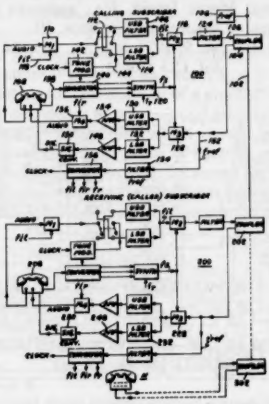
4,107,471
FREQUENCY DIVISION MULTIPLEX COMMUNICATIONS SYSTEM

Joseph Reed, Stamford, Conn., assignor to International Telephone & Telegraph Corp., Nutley, N.J.

Filed Mar. 22, 1977, Ser. No. 779,970

Int. Cl.² H04J *1/06*

U.S. Cl. 179—15 FD **18 Claims**



1. A frequency division multiplex communication system, comprising:

a plurality of subscriber stations coupled to a transmission line, each of said stations including at least one transmitter and at least one receiver having respectively an assigned transmitting frequency and an assigned receiving frequency; said assigned frequencies being related by a fixed frequency separation corresponding to the difference in transmitter and receiver intermediate frequencies;

mixer means for mixing a predetermined frequency with said intermediate frequencies to derive an independent side-band signal such that one sideband thereof contains communication information and the other of sideband thereof contains signalling data;

bandpass filter means at said transmitter and said receiver

having a passband of approximately twice the difference in frequency between said transmitter intermediate frequency and said receiver intermediate frequency for rejecting undesired mixing products such that the desired sideband signal is selected;

means for coupling said independent sideband signal onto said transmission line; and

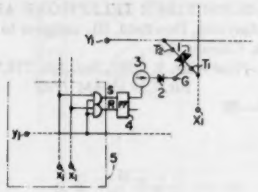
means for coupling a common reference frequency onto said transmission line to obtain simultaneous communications and signalling in the same frequency band without interference therebetween.

4,107,472

SEMICONDUCTOR CHANNEL SWITCH

Mitsuru Kawanami, Yokohama; Shinzi Okuhara, Fujisawa, and Takuzi Muksemachi, Yokohama, all of Japan, assignors to Hitachi, Ltd., Japan

Continuation of Ser. No. 484,237, Jun. 28, 1974, abandoned.
This application Jul. 21, 1976, Ser. No. 707,352
Claims priority, application Japan, Jun. 29, 1973, 48-72933
Int. Cl.[2] H04Q *3/50*; H04K *17/60*
U.S. Cl. 179—18 GF **10 Claims**



1. A semiconductor channel switch comprising:

a pair of PNPN switches having gate terminals and a self-holding action and connected to each other in anti-parallel configuration;

gate current circuit means including a gate current circuit for operatively providing a constant current to the gate terminals of said pair switches during its ON state and means for preventing reverse current flow in the circuit of said gate terminals, said gate current circuit means having high impedance and controlled to the ON or OFF state;

control means connected to the gate current circuit for operatively rendering the corresponding gate current circuit into the ON state; and

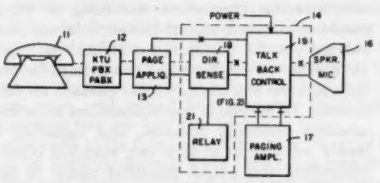
selecting means connected to the control means for selectively rendering said control means into its operative or inoperative state.

4,107,473

TWO-WAY PAGING SYSTEM TRANSMISSION DIRECTION SENSING AND CONTROL APPARATUS AND METHOD

Ben Arthur Pierce, Agua Dulce, Calif., assignor to Dracon Industries, Chatsworth, Calif.

Filed Apr. 29, 1977, Ser. No. 792,401
Int. Cl.[2] H04M *3/42*
U.S. Cl. 179—18 BF **12 Claims**



1. A voice paging and response system control adapted to be installed between a telephone at a master station and a speaker/microphone at a remote station, and operating in conjunction with a paging amplifier to drive the speaker, comprising

an amplifier connected to receive a remote signal initiated at the speaker/microphone and providing an amplified remote signal,

means for sensing the amplified remote signal and providing a remote signal timing indicative output,

means for sensing the paging signal initiated at the telephone providing a paging signal timing indicative output,

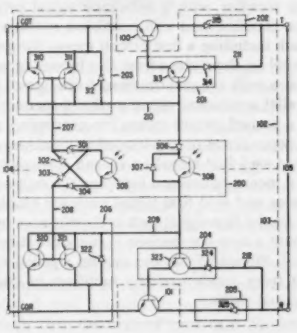
means for comparing said paging and remote signal timing indicative output and providing a paging signal leading output when the former leads the latter, and means responsive to said paging signal leading output for coupling the paging amplifier to the speaker, whereby said paging signals are coupled thereto, said last named means operating to decouple the paging amplifier from the speaker and to couple said amplifier to the telephone in the absence of said paging signal leading output.

4,107,474

BIPOLAR TRANSISTOR SWITCHING NETWORK CROSSPOINT

Herbert Anton Schneider, Boulder, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 31, 1977, Ser. No. 801,467
Int. Cl.[2] H04Q *3/52*
U.S. Cl. 179—18 GF **15 Claims**



1. A bipolar transistor crosspoint arrangement comprising:

a pair of input terminals;

a pair of output terminals;

a PNP bipolar transistor having an emitter, a base, and a collector terminal, said PNP transistor emitter being connected to one of said pair of input terminals;

an NPN bipolar transistor having an emitter, a base, and a collector terminal, said NPN transistor emitter being connected to the other one of said pair of input terminals;

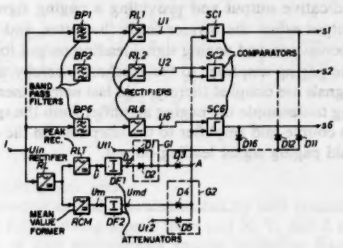
control means responsive to a crosspoint control signal for enabling said transistors; and

protective shell means connected between said control means and the respective bases of said transistors, between said control means and the respective emitters of said transistors, and between each of said output terminals and the respective collectors of said transistors for protecting said transistors from any configuration of over voltages applied to said input and said output terminals of said transistor crosspoint when said transistors are in the off state and for providing a low forward impedance across said transistors when said transistors are in the on state.

4,107,475
RECEIVER APPARATUS FOR DETECTION OF TWO VOICE FREQUENCIES IN A MULTIFREQUENCY TONE SIGNAL

Bengt Roland Carlqvist, Stockholm, and Anders Gunnar Eriksson, Johanneshov, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Jan. 3, 1977, Ser. No. 756,115
Claims priority, application Sweden, Mar. 9, 1976, 7603136
Int. Cl.² H04M *1/50*
U.S. Cl. 179—84 VF **4 Claims**

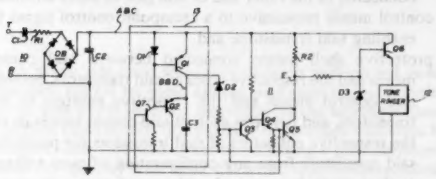


1. Receiver apparatus for the detection of at least two voice frequencies in an incoming tone signal during MFC-signalling which is insensitive to disturbing signals comprising a reference rectifier and a number of parallel connected signal paths equal to the number of the possible voice frequencies in the incoming tone signal; each of said signal paths having a band-pass filter tuned to a certain voice frequency, a rectifier and an analog signal comparator for comparing the signal obtained from the rectifier with a reference signal produced by said reference rectifier; and said reference rectifier having a first signal path including a first circuit means for generating a first signal level in dependence on the incoming signal level for comparison with a signal obtained from one of the rectifiers in said parallel connected signal paths, a second signal path including a second circuit means for generating a second signal level in dependence on the incoming signal level but of lower value than said first signal level, and a number of paths each including means connected between the output of each signal comparator and said first signal path for blocking the output signal from the first signal path in dependence on said comparison, so that a new comparison is carried out between the output signal obtained from the second signal path and a signal obtained from another of the rectifiers in said parallel connected signal paths.

4,107,476
ELECTRONIC TONE RINGER CONTROL CIRCUIT FOR A TELEPHONE SET

Edward Lloyd Henderson, Kanata, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Oct. 3, 1977, Ser. No. 838,493
Int. Cl.² H04M *1/00*
U.S. Cl. 179—84 T **5 Claims**



5. In a control circuit for controlling the on-off ringing of a line-powered electronic tone ringer in a telephone set, powered by incoming a-c ringing signals on a telephone line; the control circuit comprising:

a network for rectifying and filtering an incoming a-c voltage to provide a d-c supply voltage;

a gating circuit for connecting the tone ringer to the d-c supply voltage when said voltage exceeds a preselected minimum amplitude;

the improvement comprising:

a suppression circuit for suppressing transient voltages such as dial pulses, having a magnitude greater than, and a repetition frequency less than said a-c ringing signals, to substantially prevent false actuation of said gating circuit; said suppression circuit comprising:

a capacitor connected across the input to the gating circuit for filtering an input control signal voltage thereto;

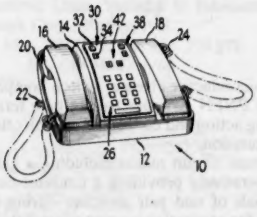
a source of constant current powered from said d-c supply voltage for charging said capacitor to develop said input control signal voltage;

means for rapidly discharging the capacitor when the amplitude of the input control signal voltage exceeds that of the d-c supply voltage.

4,107,477
MULTI-SUBSCRIBER TELEPHONE APPARATUS

Howard J. Morrison, Deerfield, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed Mar. 9, 1977, Ser. No. 775,786
Int. Cl.² H04M *1/02*
U.S. Cl. 179—99 **23 Claims**



1. Telephone apparatus for connection to a plurality of telephone lines comprising:

a base portion including at least two arrangements defining structures for accepting a telephone handset, and a hook switch control device for each handset accepting structure;

at least two telephone handsets having transmitter and receiver elements and being positionable on said base portion handset accepting structures;

means for producing output signalling on said plurality of telephone line connections; and

selection means connected to said handsets and said output signalling means for controlling the operation of said handsets and said output signalling means on said plurality of telephone line connections, said selection control means comprising first handset selection means actuable in a plurality of selection conditions corresponding to the number of telephone connections for controlling the operation of a first of said handsets on each of said plurality of telephone line connections according to the selection condition actuated, second handset selection means actuable in a plurality of selection conditions corresponding to the number of telephone line connections for controlling the operation of a second of said handsets on each of said plurality of telephone line connections according to the selection condition actuated, and signalling selection means actuable in at least two selection conditions for controlling said output signalling means to operate on each of said plurality of telephone line connections according to the selection conditions actuated.

4,107,478

ANGLE MODULATED WAVE DEMODULATION SYSTEM

Nobuaki Takahashi, Yamato; Kazunori Nishikawa, Fujisawa; Yoshiki Iwasaki; Masaaki Satoh, both of Yokohama; Katsuhiro Ohba, Yokohama; Shinji Nakamura, Tokyo; Tatsuo Sawada, Sagamihara; Nobuhide Ohsaki, Yokohama; Yasuo Itoh, Tokyo; Nobuaki Suda, Yamato; Yasuhisa Okabe, Zama, and Hideaki Ozaki, Sagamihara, all of Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

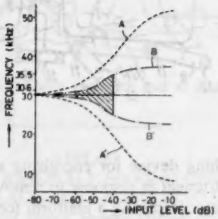
Continuation of Ser. No. 502,531, Sep. 3, 1974, which is a continuation of Ser. No. 294,371, Oct. 2, 1972, abandoned. This application Jun. 21, 1976, Ser. No. 698,191

Claims priority, application Japan, Oct. 5, 1971, 46-77531; Feb. 16, 1972, 47-16186; Feb. 23, 1972, 47-18109; Mar. 3, 1972, 47-22098; Apr. 6, 1972, 47-33842; Apr. 22, 1972, 47-40677; May 24, 1972, 47-51495

The portion of the term of this patent subsequent to Sep. 28, 1993, has been disclaimed.

Int. Cl.² G11B *3/04, 3/74;* H03D *3/00*

U.S. Cl. 179—100.4 ST **4 Claims**



1. A system for demodulating an angle modulated wave which is picked up from a recording medium on which is recorded an audio signal which is angle modulated on a carrier wave, said system comprising:

a phase locked loop system including voltage controlled oscillator means; phase comparator means for comparing the phase of a carrier wave of the picked-up angle modulated wave with the phase of an oscillation signal generated by said voltage controlled oscillator means and for generating an output signal corresponding to the phase difference; time constant circuit means responsive to the phase comparator means output signal for attentuating audio frequency components more than it attenuates frequency components which are loweri frequency than audio frequency; the audio frequency components and the frequency components which are lower than the audio frequency components appearing in the output signal of said phase comparator means; the output signal of said time constant circuit means providing a demodulation signal of the picked-up angle modulated wave; and means responsive to the lower than audio frequency components from said time constant circuit means for causing the output of said voltage controlled oscillator means to follow deviations between the frequency of the picked-up carrier wave and the frequency which the carrier wave had when it was originally recorded, which deviations lie within a first lock frequency range, said last named means being further responsive to the audio frequency components from said time constant circuit means for causing the output of said voltage controlled oscillator means to follow the audio frequency deviations of the picked-up carrier wave, which deviations lie within a second lock frequency range, said second lock frequency range being more narrow than the first lock frequency range;

means responsive to the frequency of the carrier wave of the picked-up angle modulated wave which lies outside of said first lock frequency range for operating said voltage controlled oscillator mans to oscillate at a frequency which is substantially equal to the frequency which the carrier wave had when the carrier wave was recorded on the recording medium; and

means for adjusting the level of the picked-up carrier wave to be below a predetermined level at which the frequency width of said second lock frequency range begins to saturate, and means for applying the output of said level adjusting means to said phase comparator means.

4,107,479

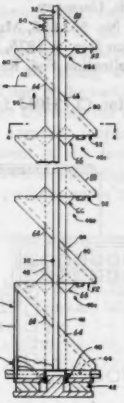
ELECTRO-ACOUSTIC TRANSDUCER

Oskar Heil, 1775 Parrott Dr., San Mateo, Calif. 94402

Filed Sep. 3, 1976, Ser. No. 720,357

Int. Cl.² H04R *1/20, 1/34, 7/02, 9/02, 9/04, 9/06*

U.S. Cl. 179—116 **15 Claims**



1. In a loudspeaker: a plurality of speaker stages aligned in a direction comprising a longitudinal axis for the loudspeaker; each speaker stage comprising a baffle plate extending perpendicular to said longitudinal axis of the loudspeaker, a diaphragm opening in said baffle plate, a sound emanating rigid non-resonant diaphragm disposed in said opening, hinge members on the periphery of said rigid diaphragm mounting said diaphragm in said opening, a deflecting plate extending at an acute angle from one side of the baffle plate to an opposite side of the baffle plate of the adjacent speaker stage thereby defining an opening between adjacent baffle plates through which sound is adapted to emanate at right angles to said longitudinal axis, the area of each said opening through which sound emanates being greater than the area of each said diaphragm; an acoustic generator for responding to an electrical signal for creating an acoustic motion; and a plurality of unitary drive means capable of longitudinal sound propagation interconnected between said acoustic generator and each of said diaphragms for moving the same in unison, said drive means being uniformly distributed with respect to the cross-sectional area of each diaphragm, whereby each said diaphragm moves bodily as a rigid unit.

12. In a loudspeaker: a speaker housing; a plurality of speaker stages aligned in a longitudinal direction and comprising one section of the loudspeaker; each speaker stage comprising a baffle plate extending perpendicular to the longitudinal direction of alignment of said stages, a diaphragm opening in said baffle plate, a sound emanating rigid diaphragm disposed in said opening, a deflecting plate extending at an acute angle from one side of the baffle plate and extending to an opposite side of the baffle plate of the adjacent speaker stage thereby defining an opening between adjacent baffle plates through which sound is adapted to emanate at right angles to said longitudinal axis, the area of each said opening through which sound emanates being greater than the area of each said diaphragm; an acoustic generator for responding to an electrical signal for creating an acoustic motion; and drive means com-

prising a plurality of separate elements each placed in tension and interconnected between said acoustic generator and each of said diaphragms for moving the same in unison; a second section mounted adjacent said one section; said drive means passing through said one section in one direction and through said second section in the opposite direction; and means interconnecting said sections for transferring the tension and motion of said separate elements between said sections in phase coherence.

4,107,480

PULSE CODE MODULATED, TIME DIVISION MULTIPLEX SWITCHING NETWORK

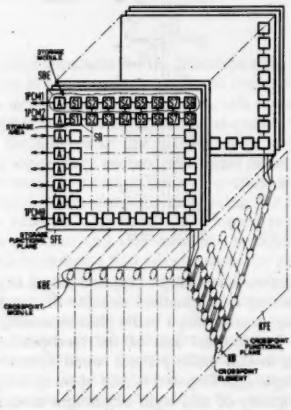
Max Schlichte, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Continuation of Ser. No. 563,096, Mar. 28, 1975, abandoned. This application Dec. 6, 1976, Ser. No. 747,933

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1974, 2415367

Int. Cl.² H04J 3/00

U.S. Cl. 179—15 AT 7 Claims



1. In a pulse code modulation/time division multiplex (PCM/TDM) switching network in a PCM tandem exchange for the connection of receive PCM/TDM trunks to transmit PCM/TDM trunks and for the time allocation of time slots to be used on the receive trunks to time slots to be used on the transmit trunks, the improvement comprising:

a plurality of storages each associated with a pair of receive and transmit PCM/TDM trunks, each of said plurality of storages having a storage capacity corresponding to the amount of data transferable over a PCM/TDM trunk within one sampling pulse frame, each of said plurality of storages comprising a plurality of storage areas selectively connectible to said associated pair of PCM/TDM trunks by a first pair of input/output connections, each of said storage areas comprising at least one storage location for storing a PCM word, wherein one of said storage locations is repeatedly seized during each sampling pulse frame assigned to a given call to sequentially store data incoming over said associated receive PCM/TDM trunk and data outgoing over said associated transmit PCM/TDM trunk, each of said storage areas having a second pair of input/output connections which are not connectible to said associated pair of PCM/TDM trunks, wherein said second pairs of input/output connections of said storage areas in one of said plurality of storages are connected to the second pairs of input/output connections of corresponding ones of said storage areas in a number of the other of said plurality of storages to thereby enable said switching network to selectively convey data over said PCM/TDM trunks.

4,107,481

TELEPHONE INSTRUMENTS

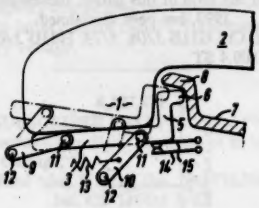
Digby Redshaw, Warwick, England, assignor to The Post Office, London, England

Filed Apr. 7, 1977, Ser. No. 785,559

Claims priority, application United Kingdom, Apr. 13, 1976, 15091/76

Int. Cl.² H04M 1/08

U.S. Cl. 179—164 1 Claim



1. A switching device for energizing and de-energizing a telephone instrument in response to removal and replacement of the hand-set, comprising a platform for receiving one capsule of the hand-set, an abutment projecting from the plane of the platform providing a location for the capsule and including at least two linkages each having a part pivotally connected to the platform, a pivotal support for each linkage, the axis of all the pivots being parallel to one another and the platform and the linkages being movable against spring bias from a first position at which the instrument is energized, to a second position at which the instrument is de-energized, by the gravity bias of the hand-set with the capsule on the platform, the arrangement being that placing the hand-set on the instrument either in the horizontal or the vertical mode with the capsule on the platform provides secure cradled location of the hand-set and causes movement of the linkages to the second position.

4,107,482

ROTARY ROCKING-BEAM SWITCH

Harry Rudolph Marker, Costa Mesa, Calif., assignor to Electronic Engineering Co. of California, Santa Ana, Calif.

Filed Jan. 31, 1977, Ser. No. 763,766

Int. Cl.² H01H 19/60, 21/80, 1/12

U.S. Cl. 200—6 B 12 Claims

6. A rotary plural-contact switch, comprising;

(a) an electrically insulative enclosure (7) having a cylindrical aperture (8),

(b) a revolvable rotor (12) having plural radial cams (19,13) with lobes, said rotor nested in said cylindrical aperture,

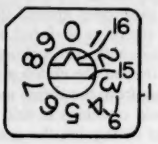
(c) plural spaced conductive contacts (31) stationarily aligned in pairs peripherally of said rotor within said enclosure,

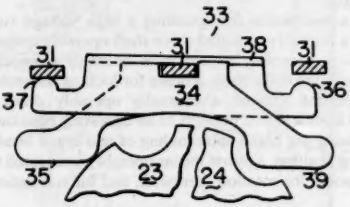
(d) a stationary member (31) between each said pair of contacts, and

(e) a conductive beam (33) having a web stressed between said stationary member and the adjacent said pair of contacts;

a cam of said rotor in mechanical contact with said beam,

whereby engagement of a said lobe with a said beam stresses the web of said beam to open the electrical contact





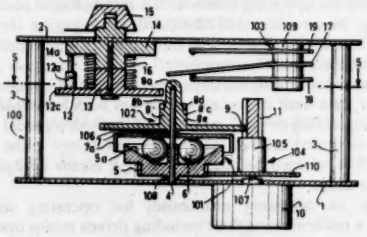
between said stationary member and at least one of said spaced contacts.

4,107,483

TIMER SWITCH ASSEMBLY HAVING CENTRIFUGAL DISPLACEMENT MECHANISM

Edouard Léon Clément Jouret, Bresso-Milano, Italy, assignor to Crouzet, Paris, France

Filed Oct. 8, 1976, Ser. No. 730,978
Claims priority, application France, Oct. 24, 1975, 75-32730
Int. Cl.² H01H *43/90, 35/10*
U.S. Cl. 200—35 R **2 Claims**



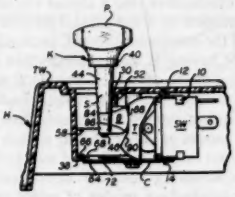
1. A timing device including a support frame, comprising two support plates, a switch, a centrifugal mechanism and a timing wheel held between said two support plates, said switch and centrifugal mechanism being freely rotatable and co-axially mounted on a first axis secured to one of said support plates, and a synchronous motor secured to said support frame for rotating said switch at a low rate of speed and said centrifugal mechanism at a faster rate of speed through two driving gears mounted on the motor shaft and engaging two toothed driven portions formed on said switch and said centrifugal mechanism, respectively, said timing wheel being freely rotatable on a second axis fixedly secured to a disc frictionally engaged with said one support plate and having a manually rotatable knob keyed thereto, said timing wheel, for setting the duration of the timing, being rotated through a first predetermined angle by a biasing coil spring whose ends are attached to said disc and timing wheel, respectively, said timing wheel having a toothed driven portion and a teethless portion at the periphery thereof, said centrifugal mechanism being provided with a dished track receiving freely riding weighted balls to axially move an actuating member disposed between said centrifugal mechanism and said switch, and a toothed driving portion being formed on said switch for engaging said toothed driven portion of said timing wheel, whereby upon energization of said synchronous motor, said switch is moved axially in a direction parallel to the rotary axis of the timing wheel by said actuating member under the action of said centrifugal mechanism to a first position in which the toothed driving portion of the switch engages said toothed driven portion of the timing wheel, said switch being prevented from keeping on moving axially by the teeth of the toothed driven portion of the timing wheel against which abuts a teethless part of said switch adjacent the toothed driving portion thereof until said timing wheel has been rotated by said toothed driving portion of said switch through a second predetermined angle so that said teethless portion of the timing wheel registers with said switch and the toothed driving portion of the switch is disengaged from the timing wheel, whereupon said switch is moved axially to a second position and the timing wheel is maintained in position by said teethless part of the switch, the deenergization of the synchronous motor allowing the switch to move in the reverse direction to its normally inoperative state and thus, through the disengagement of the teethless portion of the timing wheel from the switch, allowing the timing wheel to move back to its initial position under the action of said coil spring.

4,107,484

SAFETY SWITCH

Carl Mogens Petersen, III, Pontiac, Mich., assignor to Irvin Industries Inc., Stamford, Conn.

Filed Jul. 18, 1977, Ser. No. 816,747
Int. Cl.² H01H *27/06*
U.S. Cl. 200—42 T **6 Claims**



1. A safety switch comprising:

a key having a bit, a housing having a stationary keyway and an on-off electrical switch mounted in said housing,

said keyway being adapted to receive said key, said keyway having first and second opposed walls, said keyway providing an inserted position, intermediate rotational positions and an operative position, said second wall being substantially shorter than said first wall, said key when fully inserted in said inserted position being blocked from rotation in a first rotational direction by said first wall and free to rotate in a second rotational direction, said key when partially inserted into said inserted position being blocked from rotational movement by said first and said second walls,

said key when fully inserted in said inserted position being free to rotate in said second rotational direction through a predetermined arc to said operative position,

said key when in said operative position being free to move axially from said operative position to a partially retracted position,

said switch having an operative switching member, said key when in said operative position being aligned with said operative switching member,

axial retraction of said key to said partially retracted position when in said operative position, engaging said operative switching member to place said switch in an on state,

a wall of said housing, engagement between said wall and said bit determining said partially retracted position,

reinsertion of said key when in said partially retracted position causing said switch to switch into an off state,

said bit of said key engaging an edge of said second wall in substantially all said intermediate rotational positions of said key between the initial fully inserted position and said operative position, said edge of said second wall preventing axial retraction movement of said key in said intermediate rotational positions.

4,107,485

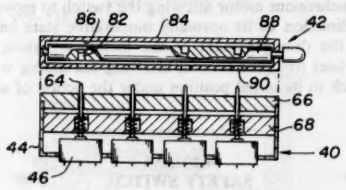
DEVICE FOR COMPLETING AN ELECTRIC CIRCUIT OR THE LIKE FOR A LOCK OR THE LIKE

Anton L. Klug, 144 Garfield Pl., East Rockaway, N.Y. 11518

Filed Sep. 12, 1977, Ser. No. 832,572

Int. Cl.[2] H01H *27/10*

U.S. Cl. 200—43 **6 Claims**



1. A device for completing a circuit for operating a lock or the like, said device comprising first and second conductors of said circuit disposed in a normally open circuit relation to each other, a cooperating plurality of switch means operatively arranged so as to be effective in converting said open circuit relation of said conductors into a closed circuit relation upon the selective actuation of some of said switch means and the non-actuation of the remainder thereof, each said switch means being of the type having at least a conductive and a non-conductive operating mode of which one such mode always is operational to the exclusion of the other, conductors for connecting said switch means in said conductive modes to said non-conductive modes of other of said switch means so as to form a partial series interconnection of said switch means, and a switch means-actuating member operatively effective to modify the non-conductive modes of select numbers of said switch means and not to disturb the conductive modes of the remainder thereof upon movement thereof into a position adjacent said switch means so as to cause the aforesaid modification therein, whereby said switch means-actuating member in said position adjacent to said switch means is effective in establishing a closed circuit relation between said first and second circuit conductors.

4,107,486

SWITCH OPERATING MECHANISMS FOR HIGH VOLTAGE SWITCHES

David M. Evans, Palatine, Ill., assignor to S & C Electric Company, Chicago, Ill.

Filed Jun. 30, 1976, Ser. No. 701,064

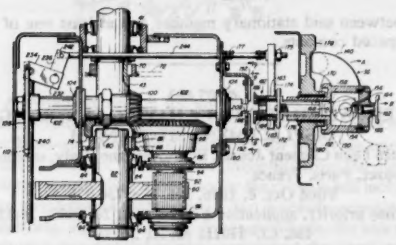
Int. Cl.[2] H01H *31/00*

U.S. Cl. 200—48 R **12 Claims**

1. In a mechanism for operating a high voltage switch including a rotatably mounted drive shaft connected to the switch for opening and closing the switch in response to rotation of the drive shaft, a motor, and a gear train operably connected to the motor, a clutch means disengageably connecting the gear train to the drive shaft, a selector handle mounted for pivotable movement between a first and a second position; a selector shaft connected to said selector handle for pivotable movement with the selector handle; means operably connected with the selector shaft for causing the clutch means to engage the gear train when the selector handle is in the first position, and for causing the clutch means to disengage the gear train when the selector handle is in the second position; an improvement comprising:

a locking plte positioned around the drive shaft adapted to move along the drive shaft but constrained from rotating with the drive shaft, said locking plate having a plurality of openings therein, the clutch means having a plurality of pins extending from the clutch means, said pins positioned to engage said openings in said locking plate when the clutch means disengages the gear train so that the drive shaft is prevented from rotating, and said pins disengaging said openings when the clutch means engages the gear train so that the drive shaft can be rotated by the gear train.

5. In a mechanism for operating a high voltage switch including a rotatably mounted drive shaft operably connected to the switch, a motor, a gear train operably connecting the motor with the drive shaft, a brake for locking the motor upon deenergization thereof, a manually operably crank handle foldable from a stored position to an operating position; means for releasing the brake upon folding of said crank handle to an operating position; a piston means operably connected with the crank handle for rotation therewith, and for translational mo-



tion in response to folding of the crank handle from a stored position to an operating position, the piston means including engaging means associated therewith for engaging the gear train so that rotation of the crank handle will rotate the drive shaft; an improvement comprising:

means for preventing the engaging means from engaging the gear train until the crank handle has both been folded to the operating position and rotated through a partial revolution thereof so that torsional energy stored in the drive shaft is released before the engaging means engages the gear train.

11. In an operating mechanism for operating devices through a resilient drive shaft including driven means operably connected to the drive shaft for rotation thereof; driving means; means for locking the driven means while the drive shaft is torsionally stressed; means for moving the driving means to engage the driven means; an improvement for preventing torsional snap back comprising:

means for releasing the means for locking in response to moving the driving means to engage the driven means; and

means for delaying said driving means from engaging the driven means until the torsional stress in the drive shaft has been relieved.

4,107,487

INTERRUPTER SWITCH ARRANGEMENT

David M. Evans, Palatine, Ill., assignor to S & C Electric Company, Chicago, Ill.

Filed Mar. 9, 1977, Ser. No. 775,905

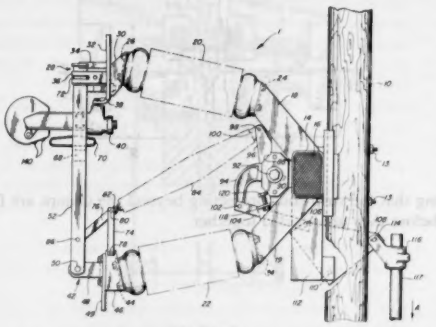
Int. Cl.[2] H01H *33/44*

U.S. Cl. 200—48 KB **17 Claims**

1. In an electrical switch of the type which includes a first

insulator having a contact thereon; a switch blade pivotally mounted to a second insulator for movement into and out of engagement with the contact in a plane including the insulators; and a reciprocable push rod for pivoting the switch blade upon movement of a distal portion of the push rod, an axis of the push rod through the distal portion being included in the plane; an improved linkage means for connecting the push rod to the switch blade, comprising:

a first link having a first pivotal connection to the switch



blade near the pivotal blade mount, and a second pivotal connection to a proximate portion of the push rod included by the axis; and

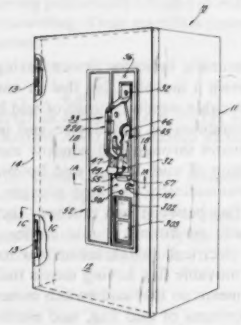
a second link having a first pivotal connection to a fixed point near the pivotal blade mount and a second pivotal connection to the proximate push rod portion, all force applied to and exerted by the push rod along the axis thereof due to movement of its distal portion being applied to, and along, a line defined by the pivotal connections of the first link during the movement of the switch blade.

4,107,488

PLATFORM MOUNTED SWITCH OPERATING MECHANISM

Frank R. Keller, Villanova, Pa.; Frank W. Kussy, Randallstown, Md.; Bernard DiMarco, Bellefontaine, Ohio, and Michel M. Fenneteau, Gaithersburg, Md., assignors to Gould Inc., Rolling Meadows, Ill.

Filed Dec. 2, 1976, Ser. No. 746,833
Int. Cl.[2] H01H 9/22
U.S. Cl. 200—50 A **10 Claims**



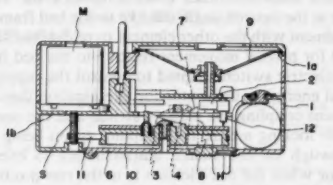
1. Enclosed switch apparatus including an enclosure having a front opening, a cover hingedly connected along a first of its edges to said enclosure for closing said opening, switch means inside said enclosure including a contact operating mechanism, switch operating means mounted to said enclosure forward of said contact operating mechanism, said operating means including platform means comprising a hollow narrow housing, a U-shaped manual operating handle having arms positioned adjacent opposite sides of said housing and having an end portion thereof keyed to pivot means extending transversely of said housing, linkage means keyed to said pivot means extending transversely of said housing, linkage means keyed to said pivot means and connected to said operating mechanism for operation of the latter by operation of said handle, said cover including means defining aperture means through which said housing extends when said cover is closed, said aperture means disposed adjacent a second edge of said cover opposite said first edge thereof, cover catch means on said platform means, defeatable cover interlock means on said platform means to prevent operation of said catch means to release said cover when said handle is in switch closed position, and defeatable switch interlock means on said platform means to prevent operation of said handle to switch closed position when said cover is open, said catch means having a cover holding portion extending through said aperture means forward of said cover when the latter is closed.

4,107,489

SWITCH MECHANISM FOR SIMPLE PHONOGRAPH

Katsumi Watanabe, Kawasaki, Japan, assignor to Yugen Kaisha Watanabe Kenkyusho, Japan

Filed May 19, 1976, Ser. No. 687,692
Claims priority, application Japan, May 21, 1975, 50-68132[U]
Int. Cl.[2] H01H 35/00; G11B 3/00; H01H 3/00
U.S. Cl. 200—52 R **5 Claims**



1. A switch mechanism for use in a simple phonograph, comprising:

(a) a casing having an opening and closing flap;

(b) a pivotally moveable pickup bracket which travels along a path coincident from the peripheral edge to the center of a turntable of the phonograph;

(c) a moveable contact piece extending into the path of the terminal end of the pivotal movement of the pickup bracket, said contact piece being biassed against the direction of movement of said pickup bracket toward the terminal end thereof;

(d) a fixed contact member against which said moveable contact piece is biassed and supported;

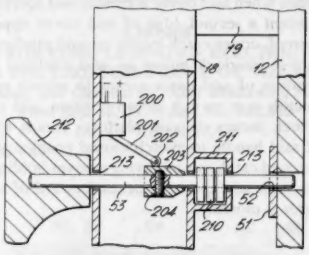
(e) a pivotally moveable switch actuator elastically biassed such that one end thereof thrusts out the free end of said moveable contact piece against its elastic forces so as to break the contact thereof with the fixed contact member, and

(f) a pawl element disposed on the openin, and closing flap of the casing and projecting inwardly into the interior of the casing, the pawl element having a tapered end so that when the casing is closed said tapered end of said pawl element pushes the switch actuator such that the switch actuator is axially displaced away from the switch upon the engagement of the actuator with the pawl when the flap is closed.

4,107,490
HOSPITAL BEDS

Francis Xavier Keane, 261 N. Circular Rd., Dublin, Northern Ireland (7)

Filed Feb. 25, 1977, Ser. No. 772,063
Claims priority, application United Kingdom, Mar. 4, 1976, 445/76
Int. Cl.[2] H01H 3/00, 3/42
U.S. Cl. 200—52 R 5 Claims



1. In a hospital bed comprising a bed frame, a supporting structure for a stretcher pivotally mounted in the bed frame for oscillation relative to the bed frame, an electric motor arranged to effect oscillation of the supporting structure relative to the bed frame upon energization of the motor, and means for locking the supporting structure at a desired angle relative to the bed frame, the locking means comprising cooperating elements on the bed frame and the supporting structure respectively, the cooperating elements including one of the elements arranged to assume two selected rest positions respectively in engagement with the other element to lock the supporting structure at the desired angle relative to the bed frame and out of engagement with the other element to release the supporting structure for pivotal movement relative to the bed frame:

(a) an electric switch adapted to control the supply of electrical energy to the motor for energization thereof, and

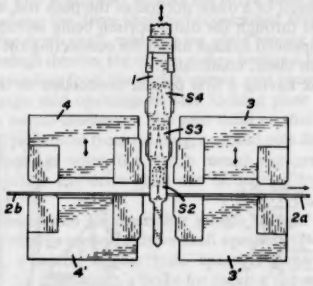
(b) means coupling the electric switch and the one element of the locking means, the coupling means being arranged to switch on the switch automatically to energize the motor when the one element is in the rest position out of engagement with the other element to release the supporting structure and to switch off the switch when the one element is in the rest position in engagement with the other element to lock the supporting structure.

4,107,491
WELDING MACHINE SPACER PLATE WITH SENSORS

Charles A. Toma, Warren, and Walter F. Haessly, Salem, both of Ohio, assignors to The Taylor Winfield Corporation, Warren, Ohio

Filed Apr. 19, 1976, Ser. No. 678,154
Int. Cl.[2] H01H 3/60
U.S. Cl. 200—61.42 2 Claims

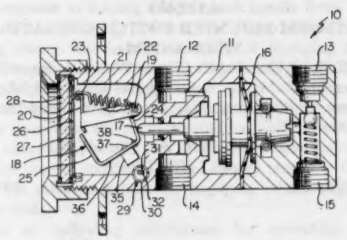
1. For use in a welding machine, a spacer bar for selectively spacing the amount of projection of metal strip ends beyond two pairs of welding clamps on opposite sides of said bar, before welding the ends of the strip ends together to insure that the strip ends are flushly positioned before welding, said spacer bar comprising steps on opposite sides throughout its length to provide longitudinal portions of varying widths of the bar to vary the extent of projection of the strip ends beyond the ends of said two pairs of welding clamps, an opening inside each of the stepped sides of different width, a pair of pivotally mounted switch actuating elements on each side of said bar within each opening, spring means normally biasing the free end of said switch actuating elements beyond the sides of said bar, a proximity switch located in each cavity adjacent to and inward of said free end so as to be actuated upon retraction of said free end of said switch actuating element inwardly of the cavity in which it is located to complete an energizing circuit to clamp the associated pair of clamps together, thereby assuring that the strip ends projecting beyond the clamps are flush before they are welded together.



4,107,492
PNEUMATIC OPERATED SWITCH HAVING MOVABLE FLAG, SWITCH ACTUATOR MOUNTED THEREON, AND SWITCH IN CHAMBER DISPLACED FROM MEASURED FLOW PATH

William T. Moon, Jr.; Arden D. Rogers; Clifford E. Goff, and Harry B. Bannon, all of Knoxville, Tenn., assignors to Robertshaw Controls Company, Richmond, Va.

Filed May 5, 1976, Ser. No. 683,623
Int. Cl.[2] H01H 35/40
U.S. Cl. 200—81.9 M 5 Claims



5. In a pneumatic indicator device having a housing means carrying therein a movable flag that in one position visually indicates through a window means of said housing means one pneumatic condition of said device and in another position visually indicates through said window means another pneumatic condition of said device, said housing means carrying therein a pneumatically operated plunger that engages and moves said flag between said positions thereof in relation to said pneumatic conditions of said device, the improvement comprising electrical switch means carried in said housing means, said movable flag having means thereon that operates said switch means so that said switch means electrically indicates said positions of said flag, said electrical switch means being magnetically operated, said means on said flag magnetically operating said switch means when said flag is in one of said positions thereof, said means on said flag comprising a magnet carried by said flag, said magnet being riveted to said flag by a single rivet, said flag carrying two other rivets adjacent said magnet to prevent rotation of said magnet about said single rivet thereof.

4,107,493

RADIATOR CAP

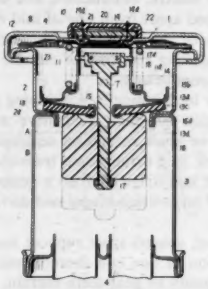
Toshio Nagara, Toyota; Kogoro Nakagawa, Kariya; Nobumasa Higo, Toyota; Masanori Kuno, Nagoya; Hiroshi Arai, and Jun Ota, both of Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 11, 1975, Ser. No. 557,379

Claims priority, application Japan, Mar. 14, 1974, 48-29666

Int. Cl.[2] H01H *35/18*

U.S. Cl. 200—84 C **6 Claims**



1. A radiator cap for sealing a valve seat located within the filling neck of a radiator and for monitoring coolant levels within the radiator and signaling when the coolant level within the radiator falls below a predetermined level comprising:

a cap body,

a gasket assembly connected to said cap body,

means fixed to said cap body for generating a signal indicating that the coolant has fallen below the predetermined level, and

float means for sensing the level of coolant within said radiator and actuating said generating means, said float means being constructed to move up and down in accordance with changes in the level of the coolant,

wherein said gasket assembly comprises a support member having a gasket fixed thereto, said support member and said gasket having an opening extending therethrough, said float means comprising a movable shaft located within said opening, said shaft having a top end a bottom end, a float member attached to said bottom end, a magnet attached to said top end, said generating means comprising a reed switch located so as to be opposite said magnet

said cap further comprising a reversed-cup-shaped support member secured to said cap body and having guide slits, said magnet having projections adapted to slidably engage said slits so that twisting of said magnet is restricted during movement thereof.

4,107,494

MASTER CYLINDER RESERVOIR WITH VACUUM RELIEF DIAPHRAGM AND GUARDED FLUID LEVEL SENSOR

Robert O. Tuegel, St. Louis County, Mo., assignor to Wagner Electric Corporation, Parsippany, N.J.

Continuation of Ser. No. 637,643, Dec. 4, 1975, Pat. No. 4,058,694. This application Aug. 8, 1977, Ser. No. 822,940

Int. Cl.[2] H01H *35/18*

U.S. Cl. 200—84 C **4 Claims**

1. A brake fluid reservoir comprising:

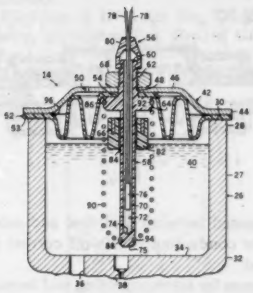
a main body portion;

a cap mounted on the main body;

brake fluid level sensor means mounted on the reservoir and protruding thereinto for indicating a predetermined minimum level of brake fluid in the reservoir;

said fluid level sensor including float means for floating on the surface of the brake fluid;

diaphragm means sealingly secured in the reservoir for corresponding movement into said reservoir in response to a decrease in the level of brake fluid in the reservoir and for sealingly separating a brake fluid containing portion of the reservoir from an air containing portion;



said corresponding movement being produced by differential air pressure on the two sides of said diaphragm; and

means surrounding the float means for maintaining the diaphragm means from interfering engagement with the float means.

4,107,495

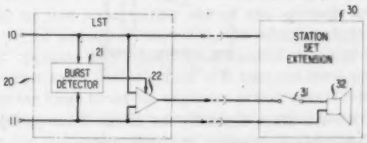
ELECTRONIC TONE RINGER

George Thomas Hawley, Murray Hill, and Lawrence Henry Young, Hanover Township, Morris County, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 11, 1977, Ser. No. 795,946

Int. Cl.[2] H04M *1/26*

U.S. Cl. 179—84 T **11 Claims**



1. A telephone station set installation coupled to a central office line providing preconditioning signal bursts of predetermined characteristics preceding ringing signals comprising:

a normally quiescent amplifier for providing ringing signals appearing across said line to an alerting transducer operative in response to a control signal and

a burst detector responsive to said preconditioning signal bursts for developing said control signal and applying it to said amplifier for the duration of said ringing signals.

4,107,496

VACUUM SWITCHING APPARATUS WITH DOUBLE INTERRUPTION AND INCLUDING AN INTERPOSED BARRIER

Jan C. Clason, Hengelo, Netherlands, assignor to Hazemeijer B.V., Hengelo, Netherlands

Filed Dec. 17, 1974, Ser. No. 533,626

Claims priority, application Netherlands, Dec. 21, 1973, 7317611

Int. Cl.[2] H01H *33/00*

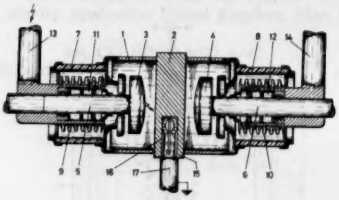
U.S. Cl. 200—144 B **5 Claims**

1. Vacuum switching apparatus for interconnecting a bus bar to a feeder cable and selectively connecting said bus bar and said feeder cable to ground, comprising:

a housing;

a first vacuum switch within said housing and connected to said bus bar;

a second vacuum switch within said housing and connected to said feeder cable;



a barrier mounted between said first and second vacuum switches for conducting switch-off current therefrom to ground; and

grounding means for interconnecting said barrier to ground.

4,107,497

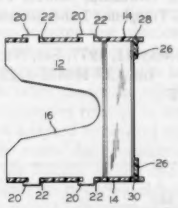
ARC CHUTE ASSEMBLY

Charles L. Jencks, Avon, and Roger N. Castonguay, Bristol, both of Conn., assignors to General Electric Company, New York, N.Y.

Continuation of Ser. No. 527,302, Nov. 26, 1974, abandoned. This application Jul. 15, 1976, Ser. No. 705,651

Int. Cl.[2] H01H *33/10*

U.S. Cl. 200—144 R **2 Claims**



1. An arc chute assembly for circuit interrupting devices, said assembly comprising, in combination:

A. a plurality of arc plates each having front, back and side edges;

B. a pair of spaced latching tangs extending laterally from each side edge of each arc plate, each said tang being undercut to provide a notch;

C. a pair of opposed, insulative sideplates mounting said arc plates, said sideplates including means forming elongated slots through which said arc plate tangs extend,

1. said arc plates being shifted to locked positions with the edge portions of said sideplates at one end of said slots engaged in said notches;

D. a separate backplate detachably mounted by said sideplates in engaging relation with the back edges of said arc plates to sustain the locked positions thereof.

4,107,498

DISCONNECT SWITCH AND DRIVE MECHANISM THEREFOR

John H. Golota, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 15, 1976, Ser. No. 649,180

Int. Cl.[2] H01H *33/80*

U.S. Cl. 200—148 B **3 Claims**

1. A disconnect switch for use in gas insulated systems comprising:

an elongated sealed tank containing an insulating gas and having opposing ends through which electrical conductors sealingly enter said tank;

a pair of longitudinally spaced apart electrodes disposed within said tank, said electrical conductors electrically coupled to, and terminating at, said electrodes;

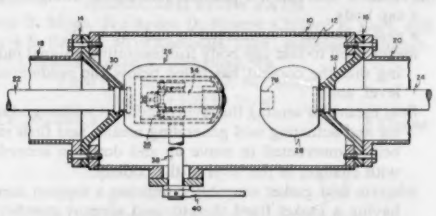
a longitudinally reciprocating switch blade disposed within said tank and coupled to one of said electrodes, said blade capable of being in electrical contact with both of said electrodes to permit the flow of electric current therebetween, thereby permitting the flow of electric current between said electric conductors, and said blade capable of being spaced apart from one of said electrodes to prohibit the flow of electric current between said electrodes, thereby prohibiting the flow of electric current between said electric conductors;

drive means for longitudinally positioning said switch blade disposed within said tank, said drive means including a rotatable drive shaft extending sealingly outwardly beyond said tank, said drive means translating the rotational movement of said drive shaft to a generally straight line movement of said switch blade; said drive means comprising:

a pair of parallel, spaced apart support members having an arcuate section at one end thereof, said arcuate section having a plurality of gear teeth therein;

a pair of crank elements pivotally coupled to said support members and having aligned openings therein;

a connecting rod disposed within said crank element aligned openings and coupling said crank elements together, said



connecting rod being rotatable with respect to said crank elements;

a crank gear rotatably coupled to one of said crank elements and positioned adjacent to, and cooperating with, said support member gear teeth;

a rod gear fixedly secured to said connecting rod and positioned adjacent to, and cooperating with, said crank gear, said support member gear teeth having a pitch diameter twice the pitch diameter of said rod gear;

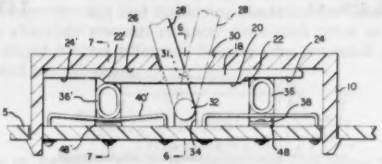
a drive arm fixedly secured to said connecting rod and movable therewith, and having an end section distal from said connecting rod, said distal end section being rotatably coupled to said switch blade, the distance from said connecting rod to said distal end section coupling to said switch blade being substantially the same as the distance from said connecting rod to the location of the pivotal coupling of said crank elements to said support members; and

said rotatable drive shaft being coupled to one of said crank elements and aligned with the pivotal coupling of said crank elements to said support members, the rotation of said drive shaft causing a pivotal movement of said crank elements and said connecting rod, the pivotal movement of said crank elements causing said support member gear teeth to rotate said crank gear, causing the rotation of said rod gear, and causing the rotation of said connecting rod within said aligned openings, the rotation and pivotal movement of said connecting rod causing a substantially straight line movement of said drive arm distal end section and said switch blade.

4,107,499
SWITCH ASSEMBLY FOR CIRCUIT BOARDS

Charles Harry Weidler, Lancaster, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 22, 1976, Ser. No. 753,405
Int. Cl.[2] H01H *15/04*
U.S. Cl. 200—153 LA 6 Claims



1. A switch assembly on a circuit board for closing and opening a circuit between two conductors on said board, said switch assembly comprising:

a pair of fixed and movable keyboard switch contacts on said circuit board, said fixed contact comprising a fixed button type contact on said board which is electrically connected to one of said conductors, said movable contact comprising a generally rectangular spring member having mounting legs extending from each end thereof, and having side edges between said ends, said mounting legs extending into said circuit board and being electrically connected to the other one of said conductors on said circuit board, said spring member being upwardly concave and being resiliently deformable downwardly and into contact with said fixed contact,

a switch housing which is separate from said contacts, said housing being in enclosing relationship to said contacts and having a top wall and opposed sidewalls which are spaced from said side edges of said movable contact, said housing having integral latch arms extending through openings in said circuit board to latch said housing to said circuit board,

actuator camming means slidably contained in said housing against said top wall, said actuator camming means being movable parallel to said circuit board between first and second positions,

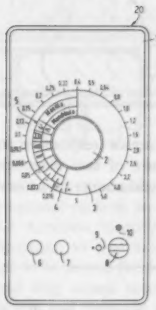
motion translating means extending between said sidewalls and transversely with respect to said side edges of said movable contact, groove means in said sidewalls, end portions of said motion translating means extending into said groove means for guiding said motion translating means towards and away from said movable contact,

said actuator camming means being effective upon movement from said first position to said second position to engage said motion translating means and move said motion translating means towards said movable contact whereby said translating means flexes said movable spring contact towards said fixed contact thereby to close said switch, said movable spring contact being effective to move away from said fixed contact upon movement of said actuator means from said second position to first position and to move said motion translating means towards said top wall.

4,107,500
TIME SWITCH DEVICE FOR X-RAY DIAGNOSTIC EQUIPMENT

Georg Distler, Adlitz, and Horst Göetzl, Erlangen, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sep. 3, 1976, Ser. No. 720,459
Claims priority, application Fed. Rep. of Germany, Oct. 6, 1975, 2544697
Int. Cl.[2] H01H *9/00;* G01P *13/00;* G09F *9/00*
U.S. Cl. 200—308 8 Claims



1. In a time switch device for X-ray diagnostic apparatus, particularly for preparation of dental exposures, said device including a housing, a knob mounted on the housing for rotation to set the exposure period, a time scale of exposure periods on a scale carrier concentrically arranged to the knob, a symbol carrier concentrically arranged to the knob and being mounted for rotation relative to the time scale, said symbol carrier having symbols of the objects being X-rayed arranged thereon one relative to the other at such a spacing relative to each other so that upon setting one of said symbols to the exposure period associated therewith, the other symbols will be located opposite their respective associated exposure periods on the time scale, and an indicia of at least one mark so that rotation of the knob to set the exposure period causes relative movement between the indicia and both the symbol carrier and time scale, the improvements comprising said knob being movable in an axial direction, and said symbol carrier and said knob having coupling means being engaged with each other as the knob assumes a predetermined axial position to couple the symbol carrier for rotational movement with said knob.

4,107,501
MICROWAVE OVEN CONTROL SYSTEM

Richard Ironfield, Williamsburg, Iowa, assignor to Raytheon Company, Lexington, Mass.

Filed Apr. 13, 1976, Ser. No. 676,460
Int. Cl.[2] H05B *5/00*
U.S. Cl. 219—10.55 B 5 Claims

1. A microwave oven comprising:

a microwave energy generator for supplying microwave energy to a heating cavity;

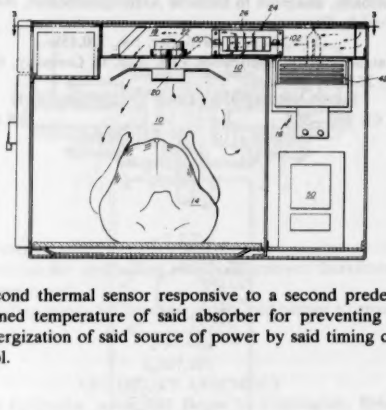
a source of power for said microwave generator;

means coupled between the output of said microwave generator and said cavity for substantially preventing the supply of microwave energy from said cavity to said microwave generator, comprising a microwave ferite circulator and a microwave energy absorber;

a first thermal sensor responsive to a first temperature of said microwave energy absorber for maintaining a flow of a cooling fluid past said microwave energy absorber when said microwave energy generator is de-energized;

a timing control for energizing said source of power and for

maintaining said flow when said microwave energy generator source of power is energized; and



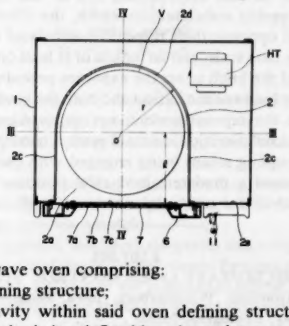
a second thermal sensor responsive to a second predetermined temperature of said absorber for preventing the energization of said source of power by said timing control.

4,107,502

MICROWAVE OVEN

Junzo Tanaka, Fujiidera, and Toshio Kai, Yamatokoriyama, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Apr. 5, 1977, Ser. No. 784,772
Claims priority, application Japan, Apr. 6, 1976, 51-38966
Int. Cl.[2] H05B *9/06*
U.S. Cl. 219—10.55 F **5 Claims**



1. A microwave oven comprising:

an oven defining structure;

a heating cavity within said oven defining structure, said heating cavity being defined by a base plate, a top wall, a front wall having an access opening therein, a pair of spaced substantially planar side walls, and a concave rear wall having a semi-circular cross-sectional configuration, said concave rear wall smoothly joining said side walls so that said rear wall and side walls together form a continuous wall member of U-shaped configuration;

door means for selectively opening and closing said access opening in said front wall;

means for supplying microwave energy into said heating cavity; and

rotary table means of approximately circular shape, mounted within said heating cavity for rotation about a rotational axis, for receiving an object to be heated, said rotary table means being positioned within said heating cavity such that said semi-circular rear wall is concentric with said rotational axis.

4,107,503

METHOD FOR ELIMINATING RESIDUAL MAGNETISM IN PIPE-BLANK FOR WELDED STEEL PIPE LONGITUDINALLY SEAM-WELDED FROM INSIDE

Fusao Koshiga, Kawasaki; Jinkichi Tanaka, Yokohama; Itaru Watanabe, Yokohama; Motoaki Suzuki, Yokohama; Toshifumi Kojima, Yokohama; Hiroyoshi Matsubara, Fukuyama; Tatsumi Osuka, Fukuyama; Kenji Takeshige, Fukuyama; Takashi Nagamine, Fukuyama, and Osamu Hirano, Fukuyama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 10, 1977, Ser. No. 776,235
Claims priority, application Japan, Apr. 6, 1976, 51-37825
Int. Cl.[2] B23K *31/06*
U.S. Cl. 219—61 **7 Claims**

1. In longitudinally seam-welding a pipe-blank for welded steel pipe from the inside along a groove by the arc welding process comprising attaching a tab plate to at least a terminal end of said pipe-blank, supplying a direct electric current for welding to a consumable electrode through a cable, and moving said consumable electrode from a first end of the pipe-blank to the terminal end of the pipe-blank while effecting seam-welding,

a method for eliminating a residual magnetism in said pipe-blank produced by said direct electric current for welding flowing through said cable introduced into said pipe-blank, which method comprises:

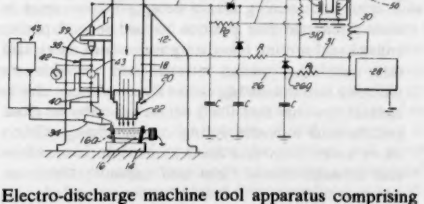
reversing the polarity of said consumable electrode to a polarity opposite to that used for said longitudinal seam-welding, when said consumable electrode is adjacent said tab plate at the terminal end of the pipe-blank subjected to said longitudinal seam-welding, for causing a direct electric current for eliminating magnetism to flow through said cable in the opposite direction to that of said direct electric current for welding, thereby eliminating said residual magnetism in said pipe-blank.

4,107,504

METHOD AND APPARATUS FOR CONTROLLING AN ELECTRO-DISCHARGE MACHINE TOOL

Raymond Dinsdale, Nelson, England, assignor to Rolls-Royce Limited, London, England

Filed Apr. 6, 1977, Ser. No. 785,250
Claims priority, application United Kingdom, Apr. 15, 1976, 15445/76
Int. Cl.[2] B23P *1/08*
U.S. Cl. 219—69 E **7 Claims**



1. Electro-discharge machine tool apparatus comprising a pair of complementary rod electrodes mounted on an electro-

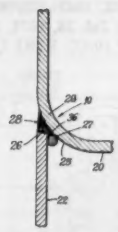
discharge machine tool for relative reciprocating movement towards and away from each other, moving means for causing said relative reciprocating movement of said complementary electrodes and a similar, relative movement between at least one machining electrode and a workpiece electrode, first means electrically connectable to said complementary electrodes and at least one machining electrode and workpiece electrode and second means electrically connectable to a source providing an electrical reference potential, said first means in operation, being sensitive to differences in electrical potential across the complementary electrodes and across said at least one machining electrode and workpiece electrode relative to the electrical potential across said second means and on sensing said differences, to act upon said moving means to actuate it so as to cause relative movement of the complementary electrodes and said machining electrode and said workpiece electrode towards or away from each other at a rate determined by the difference between the potentials at said first and second means.

4,107,505

WELDMENT

Larry G. Eftefield, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 566,500, Apr. 9, 1975, Pat. No. 3,986,784.
This application Jun. 25, 1976, Ser. No. 700,062
Int. Cl.[2] B23K *9/18*
U.S. Cl. 219—76.14 **5 Claims**



1. The method of welding to a first member having a surface portion a second member having an edge portion disposed adjacent said surface portion, comprising the steps of: welding a back-up element to said first member to define a substantially continuous elongated weld stop along an arcuate part of said surface portion; disposing said second member edge portion in engagement with said back-up element so as to cause said first member surface portion, said back-up element, and said second member edge portion to cooperatively define a weld space with the first and second members defining a rearwardly narrowing outer portion of said space terminating in a position of close proximity of said first member to said second member, and defining a rearwardly widening inner portion of said space between said position and the back-up element; and providing an arc weld substantially filling said weld space and defining a continuous welded joint between said surface portion and said edge portion in both said outer and inner space portions bounded rearwardly by said weld stop, said first and second members at said position defining a flow restricting passage for throttling forces of the welding arc tending to urge the weld stop free of said first member during the arc welding step.

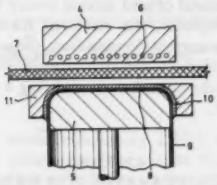
4,107,506

SOLDERING METHOD

Ismael Martinez Pelegri, Pasaje Dos de Mayo 20, Barcelona, Spain

Filed Feb. 18, 1976, Ser. No. 659,039
Int. Cl.[2] H05B *5/00*
U.S. Cl. 219—85 A **1 Claim**

1. In a method of soldering metallic parts, of the type based on the use of a filler metal having a lower melting point than said metallic parts, of two press plates, at least one of which is provided with an induction winding and at least one insulating means, partiuclarly applicable to the soldering of thin parts having a large surface area and at least one portion of the respective surfaces forming a non-planar surface, the improvement wherein a metallic ring having an inner surface complementary to said non-planar surface, favorable magnetic characteristics and a coefficient of expansion lower than that of the two metallic parts to be joined is positioned coaxially with said



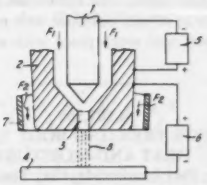
parts, externally thereto, and immediately adjacent the portion thereof forming a non-planar surface, so as to create pressure by reaction in a radial direction, in cooperation with a press acting in an axial direction, so that said ring embraces the portion of the surfaces to be joined forming a non-planar surface and also that said ring means receives heat energy by electromagnetic induction and transmits said heat by conduction to said parts, whereby the heat and pressure communicated by the ring to said parts produces the bonding of said parts at the non-planar surfaces thereof.

4,107,507

ARC WELDING PROCESS AND APPARATUS

Jean-Pierre Schultz, Les Mureaux; Francis Cuny, Mantes-La-Jolie; Daniel Payraudeau, Aulnay-sous-Bois, and Jean-Marie Tritz, Les Mureaux, all of France, assignors to L'Air Liquide Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Jun. 3, 1974, Ser. No. 475,879
Claims priority, application France, Jun. 6, 1973, 73.20490
Int. Cl.[2] B23K *9/00*
U.S. Cl. 219—121 P **8 Claims**



1. A process for the electrical arc welding of workpieces, the process com in combination:

positioning a refractory electrode and an electrically conductive counter-electrode in spaced relationship with each other in juxtaposition with the workpiece to be welded;

supplying ionizable fluid to the space between the refractory electrode and the counter-electrode;

connecting a first d.c. voltage source between the refractory electrode and the counter-electrode to maintain the same at opposite polarities and thereby produce a first unidirectional electric current, the positive terminal of said first source being connected to said counter-electrode and the negative terminal of said first source being connected to said refractory electrode, the first current forming an arc which, in conjunction with the ionizable fluid, produces a

plasma column between the refractory electrode and the counter-electrode on the one hand, and the workpieces on the other hand, the first unidirectional current comprising a continuous uninterrupted stream of electrons in the plasma column travelling toward said workpieces; and

connecting a second d.c. voltage source between the workpieces and the counter-electrode to produce a second unidirectional current simultaneously with the first unidirectional current, the positive terminal of said second source being connected to said counter-electrode and the negative terminal of said second source being connected to said workpieces, the electrons forming the second unidirectiona current flowing from the workpieces to the counter-electrode;

each of the unidirectional currents being a continuous constant current.

4,107,508

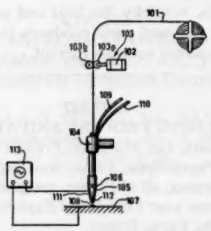
METHOD AND APPARATUS FOR WELDING USING FILLET-WIRE

Sachio Izumi, Kobe, and Tamotsu Kotani, Akashi, both of Japan, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Jun. 9, 1976, Ser. No. 694,353

Int. Cl.[2] B23K *9/12*

U.S. Cl. 219—137.7 **11 Claims**



1. A method of welding comprising the steps of continuously feeding a fillet-wire to a work piece at a welding location; heating both said fillet-wire and said work piece by a flame; passing an electrical heating current through at least a portion of said fillet-wire; and maintaining a predetermined relation between the rate at which said fillet-wire is fed to said work piece and the rate at which said fillet-wire melts, such that said fillet-wire contacts said work piece with a substantially constant pressure.

4,107,509

APPARATUS FOR TREATING BODY MEMBERS WITH HEAT AND MOISTURE

Victor H. Scher, Fort Lauderdale, Fla.; Theodore A. Fox, Winnetka, and Philip A. Sandford, Highland Park, both of Ill., assignors to Northern Electric Company, Chicago, Ill.

Filed Mar. 7, 1977, Ser. No. 775,086

Int. Cl.[2] H05B *1/00*

U.S. Cl. 219—211 **8 Claims**

1. Apparatus for treating the body with heat and moisture comprising a rectangularly-shaped electric heating pad having a waterproof covering over the entire pad with the power cord extending from one corner thereof, a double-walled fabric member forming a pocket within which said heating pad is removably received, said heating pad being coextensive with said pocket formed in said member, said member having a flap and retaining means on said flap and said pocket to hold said member in a tubular configuration with the ends of said pad being in closely spaced relation, cuffs of elastic material, each of which is attached along an edge to said member, said cuffs being positioned at opposite ends of said tubular configuration of said member, said cuffs extending the length of said pocket and each having retaining means to secure it in a closed tubular

configuration to form with said member a chamber for treatment of body members.

4,107,510

STARTING AIDS FOR COMBUSTION ENGINES

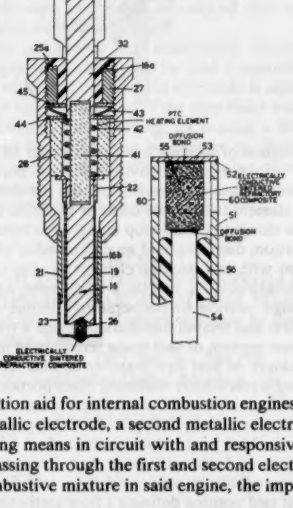
Terence Leslie Tombs; Brian Leslie Miles, and Dexter William Smith, all of Birmingham, England, assignors to C.A.V. Limited, Birmingham, England

Continuation of Ser. No. 422,149, Dec. 6, 1973, abandoned. This application May 30, 1975, Ser. No. 582,189

Claims priority, application United Kingdom, Dec. 7, 1972, 56505/72; Mar. 3, 1973, 10454/73; Mar. 15, 1973, 12546/73; Jul. 6, 1973, 32448/73; Jul. 28, 1973, 36052/73

Int. Cl.[2] F02P *19/02*; F23Q *7/22*; H05B *3/02*

U.S. Cl. 219—270 **7 Claims**



1. In an ignition aid for internal combustion engines comprising a first metallic electrode, a second metallic electrode and a resistive heating means in circuit with and responsive to electric current passing through the first and second electrodes, for igniting a combustive mixture in said engine, the improvement wherein:

said second electrode comprises an electrically conductive hollow body, removably insertable in an aperture in said engine, said body including a sleeve member and an electrically conductive bridge portion bridging one end of said sleeve member;

said heating means comprising a sintered, refractory, ceramic composite having a central portion interposed between a pair of terminal-defining end portions, said central portion having a higher electrical resistance than said end portions;

said first electrode extending into the sleeve member of said body but being spaced therefrom, said first electrode

comprising two parts which are relatively movable, said heating means disposed between one part of said first electrode and said bridge portion with said terminal end portions in a non-point contact relationship with said first electrode and said bridge portion;

spring means associated with said relatively movable parts of said first electrode for establishing electrical contact between said one part of first electrode and the bridge portion of said second electrode and said end portions of said heating means;

means for electrically connecting said relatively movable parts of said first electrode while permitting relative movement between said parts; and

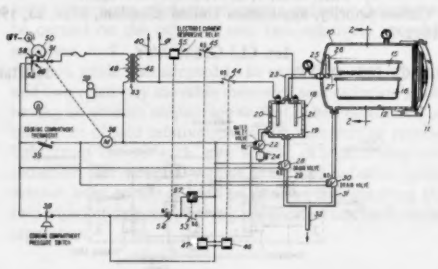
sealing means for blocking said space between the other part of said first electrode and said sleeve member of said body, preventing the passage of combustion gases therebetween, insulating and fixably positioning the other part of said first electrode with respect to said second electrode.

4,107,511

CONTROL SYSTEM FOR AN ELECTROLYTIC STEAM GENERATOR

Robert J. Shulz, Brookfield, and Orest A. Kozinczuk, Chicago, both of Ill., assignors to Innovative Patent Trust, Palatine, Ill.

Division of Ser. No. 434,506, Jan. 18, 1974, abandoned, which is a division of Ser. No. 253,409, May 15, 1972, Pat. No. 3,818,819.
This application Nov. 6, 1975, Ser. No. 629,592
Int. Cl.[2] H05B *3/60*; F22B *1/30*
U.S. Cl. 219—286 **3 Claims**



1. In an electrolytic steam generator having a steam compartment provided with a water inlet and a steam outlet and a plurality of electrodes disposed in said compartment so as to be immersed in the water in said compartment when said compartment is filled with water to at least a predetermined level, the improvement comprising

a control system for controlling the supply of water to said chamber through said inlet and for controlling the supply of current to said electrodes, said control system including

normally closed valve means for controlling the supply of water to said inlet,

means for selectively operating said valve means,

relay means for connecting a source of current to said electrodes,

means for selectively energizing said relay means,

said valve operating means including means responsive to the magnitude of the current flow between said electrodes, said current flow responsive means allowing said valve means to be opened only when the current flow between the electrodes is below a predetermined value, and

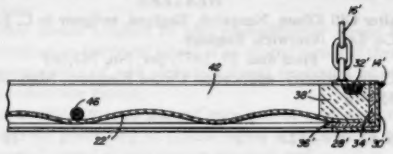
said valve operating means further including a time delay means controlled by said current flow responsive means for delaying the opening of said valve means for a predetermined time after said relay means is energized to connect said source of current to said electrodes and the current supplied to said electrodes is less than said predetermined value.

4,107,512

INSULATED RADIANT HEATER

Frank J. Brandenburg, Jr., Rte. 3, Box 28, Ashland, Va. 23005

Filed Aug. 10, 1976, Ser. No. 713,215
Int. Cl.[2] H05B *3/02*; F24H *9/08*; F28F *13/00*
U.S. Cl. 219—343 **5 Claims**



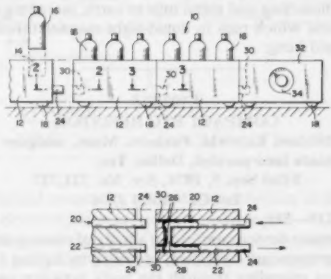
1. A radiant heater comprising a high temperature heat radiating panel, peripheral frame means for supporting said panel, said frame means including an inwardly opening channel-shaped frame having a bottom horizontal flange, an outer wall flange, and a top flange extending in overlying spaced relation to the bottom flange, said panel including a peripheral edge received between the bottom and top flanges, and insulating means interposed between said frame means and the panel for reducing heat transmission from the panel to the frame means to maintain the frame means at a substantially lower temperature than the panel, said insulating means including a layer of insulating material covering the upper surface of the bottom flange of the frame and supporting the edge of the panel therefrom, a layer of insulating material covering the inner surface of the wall flange of the frame, and insulating material between the edge of the panel and the top flange of the frame, the layer of insulating material covering the bottom flange further extending inwardly beyond the inner edge of the bottom flange a distance sufficient to prevent radiant heating of the frame from the panel, the insulating material between the edge of the panel and the top flange of the frame extending inwardly beyond the inner edge of the top flange at least a distance sufficient to prevent radiant heating of the frame from the panel.

4,107,513

SHAMPOO AND CONDITIONER WARMER

Bryan Ashford, 409 Ker Ave., Victoria, British Columbia, Canada (V9A 2B8)

Filed Jul. 5, 1977, Ser. No. 812,798
Int. Cl.[2] H05B *3/06*
U.S. Cl. 219—521 **4 Claims**



1. A bottle warming apparatus comprising:

a housing containing a pump adapted to be connected to a source of water and heating coil means for heating said water, said housing having a fluid inlet and a fluid outlet,

a receptacle for receiving a plurality of bottles containing liquid to be warmed, said receptacle including

a fluid conduit formed by a substantially U-shaped pipe having a fluid inlet end and a fluid outlet end extending beyond a side wall of said receptacle for receipt in the

fluid outlet and fluid inlet in said housing, respectively, so as to be placed in communication with said pump.

4,107,514

SUBMERSIBLE THERMOSTATICALLY CONTROLLED HEATERS

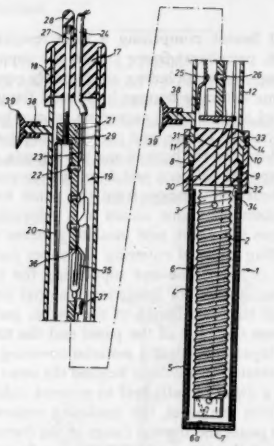
Walter Gill Ellson, Nantwich, England, assignor to C. Ellson & Co. Ltd., Nantwich, England

Filed Jan. 27, 1977, Ser. No. 763,103

Claims priority, application United Kingdom, Mar. 26, 1976, 12350/76

Int. Cl.[2] H05B *3/06*

U.S. Cl. 219—523 **11 Claims**



1. A submersible thermostatically-controlled heater, comprising a metal tube which is permanently closed in liquid-tight manner at one end and contains an electrical heating element mounted on a ceramic former and separated from the side and end walls of the tube by a wall of electrically insulating material, a tube of synthetic plastics material closed in liquid-tight manner at one end by a bung of resilient electrically insulating material and containing a thermostat mounted on a terminal block of electrically insulating material, means securing the other ends of said tubes together in liquid-tight manner and an electrical circuit for connecting said heating element to an external source of operating current through said termostat and for connecting said metal tube to earth, including electrical supply leads which pass in liquid-tight manner through apertures in said bung.

4,107,515

COMPACT PTC RESISTOR

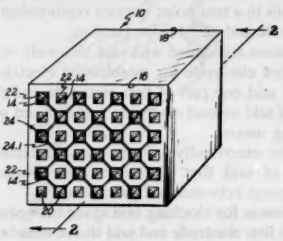
Bernard Michael Kulwicki, Foxboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 9, 1976, Ser. No. 721,727

Int. Cl.[2] H05B *3/08*

U.S. Cl. 219—541 **9 Claims**

1. A resistor device comprising a body of resistor material of positive temperature coefficient of resistivity having a plurality of passages extending through the body between ends of the body in spaced, side-by-side relation to each other in a selected pattern defining a plurality of webs of said resistor material between said passages, electrically conductive coatings on the inner walls of said passages in ohmic contact relation to the body of resistor material, first electrically conductive interconnection coating means on an end of the body electrically connecting the coatings in selected alternate ones of said passages together, and second electrically conductive interconnection coating means on an end of the body electrically connecting the coatings in others of said passages together, whereby, when said interconnection means are electrically connected to respective terminals of an electrical power source, electrical



current is directed through said webs of resistor material between the coatings in said alternate body passages and adjacent coatings in said other body passages.

4,107,516

PULSE COUNTING APPARATUS FOR MEASURING MECHANICAL MOVEMENT OF A MACHINE SUCH AS A MINING MACHINE

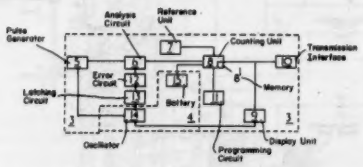
Jan Hagbert Hvidsten, Ashby-de-la-Zouch, England, assignor to Coal Industry (Patents) Limited, London, United Kingdom

Filed Mar. 7, 1977, Ser. No. 775,120

Claims priority, application United Kingdom, Mar. 23, 1976, 11622/76

Int. Cl.[2] G06M *3/04*

U.S. Cl. 235—92 FP **11 Claims**



1. Pulse counting apparatus for use with a rotary mechanical member, said apparatus receiving electrical power from an external power supply, comrising:

an internal battery;

a plurality of light emitting diodes coupled across said external power supply and said internal battery;

a plurality of phototransistors, said light emitting diodes and said phototransistors being situated on opposite sides of said rotary mechanical member, each phototransistor being controlled by a respective one of said light emitting diodes to generate electrical pulse signals in response to movement of said rotary mechanical member between said diodes and phototransistors;

first means comprising

an analysis circuit for detecting the sequence of the electrical pulse signals generaed by said phototransistors, and

a counting unit for counting the number of electrical pulse signals generated by said phototransistors, said counting unit including a memory for storing the counted number of electrical pulse signals; and

second means including a delay circuit for disconnecting a portion of said pulse counting apparatus including said light emitting diodes from said internal battery after said external power supply has been removed from said pulse counting apparatus and only after a predetermined period of time has elapsed.

4,107,517
OPTO-ELECTRIC DEVICE

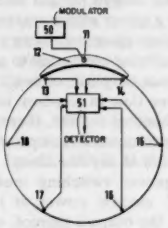
Peter Raymond Cooper, Enfield, England, assignor to The Rank Organisation Limited, London, England

Filed Jan. 6, 1977, Ser. No. 757,195

Claims priority, application United Kingdom, Jan. 7, 1976, 476/76

Int. Cl.[2] H04B *9/00;* **G02B** *5/14;* **H01J** *5/16, 39/12*

U.S. Cl. 250—199 **16 Claims**



1. Apparatus for transmitting information between two relatively rotatable members, so as to permit the relative rotation between the members to be continuous, said apparatus comprising:

a plurality of detectors sensitive to electromagnetic radiation, which, when fitted on one of the two relatively movable members are located in a circular array,

at least one source of electromagnetic radiation adapted to be carried on the other of said two relatively movable members, and

a radiation guide also adapted to be carried on said other of said two relatively movable members, said radiation guide having an arcuate output face so that, when positioned on said other of said relatively movable members to receive light from the or each said source of electromagnetic radiation, the radiation output from said radiation guide extends over an arc at least as great as that spanning the two adjacent detectors having the greatest circumferential separation.

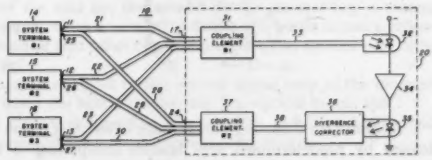
4,107,518
OPTICAL REPEATER

Donald H. McMahon, Carlisle, Mass., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Jan. 26, 1977, Ser. No. 762,694

Int. Cl.[2] H04B *9/00*

U.S. Cl. 250—199 **45 Claims**



1. An optical repeater having a first plurality of optical signal transmission lines, each including a core of transparent material and at least one of which possesses a numerical aperture $(NA)_1$ and a core with refractive index n_1, and a second plurality of optical signal transmission lines, each including a core of transparent material and at least one of which possesses a numerical aperture $(NA)_2$ and a core with refractive index n_2 comprising:

means for disposing said first plurality of optical signal transmission lines such that each optical signal transmission line in said plurality of optical signal transmission lines terminates with an end face thereof in a plane, thereby forming a planar array of said end faces;

photodetector means coupled to receive optical signals emitted from said planar array of end faces of said first plurality of optical signal transmission lines for generating an electrical signal representative of said received optical signals;

amplifier means coupled to said photodetector means for providing an electrical signal at an output terminal that is representative of said electrical signal generated by said photodetector means;

means coupled to said output terminal of said amplifier means for generating an optical signal in response to said electrical signal at said output terminal; and

means for disposing said second plurality of optical signal transmission lines such that each optical signal transmission line therein terminates with an end face thereof in a plane, thereby forming a planar array of end faces, said planar array coupled to receive said optical signal from said optical signal generating means such that said optical signal is coupled to each optical signal transmission line of said second plurality of optical signal transmission lines, whereby an optical signal propagating in one optical signal transmission line contained in said first plurality of optical signal transmission lines causes an optical signal representative thereof to propagate in each optical signal transmission line contained in said second plurality of optical signal transmission lines.

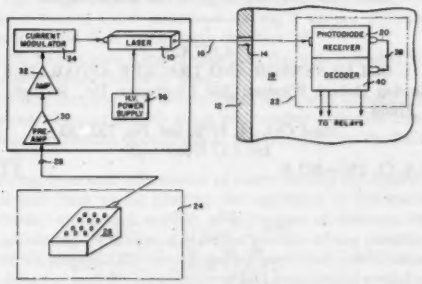
4,107,519
OPTICAL CONTROL SYSTEM FOR HIGH-VOLTAGE TERMINALS

John J. Bicek, Tinley Park, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 13, 1977, Ser. No. 787,129

Int. Cl.[2] H04B *9/00;* **H02N** *1/00;* **H04Q** *9/12*

U.S. Cl. 250—199 **2 Claims**



1. An optical system for the control of devices at the terminal of an electrostatic accelerator comprising:

a laser disposed outside the tank of the electrostatic accelerator at an optical port and having a beam directed at the terminal;

an encoding system connected electrically to the laser to modulate the beam according to a predetermined scheme;

a receiver at the terminal coupled optically to the beam to generate a signal containing the modulation of the beam; and

a decoder connected to the receiver to decode the signal and generate control signals according to the predetermined scheme,

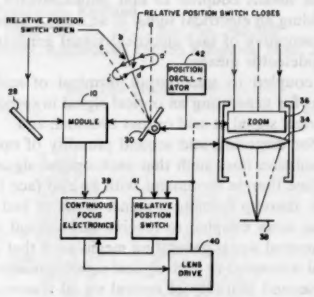
which control signals will control devices at the terminal.

4,107,520

CONTINUOUS FOCUS PROPORTIONAL CONTROLLER

Dennis J. Wilwerding, Littleton, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 6, 1977, Ser. No. 804,111
Int. Cl.[2] G01V *1/20*
U.S. Cl. 250—201 **6 Claims**



1. In an optical system including lens means and drive means for moving the lens means, an automatic focus system comprising:

range sensing means for providing a time varying first signal having first and second states, the last transition of the first signal from the first to the second state being indicative of a position of proper focus;

a signal source;

signal storage means;

first switch means connected to said range sensing means and operable in accordance with the first signal to connect said signal source to said signal storage means upon the occurrence of the last transition whereby said signal storage means thereafter stores a second signal derived from said signal source and of magnitude which varies with the time of occurrence of the last transition; and

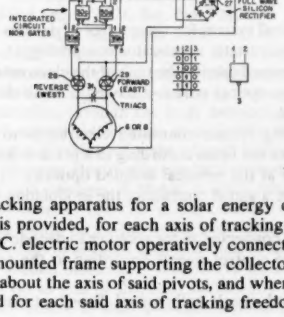
means connecting the signal storage means to the drive means to cause the drive means to move the lens mean toward the position of proper focus at a rate which depends upon the magnitude of the second signal.

4,107,521

SOLAR SENSOR AND TRACKER APPARATUS

Gordon Robert Winders, 204 Chatterson Dr., Raleigh, N.C. 27609

Filed Oct. 14, 1976, Ser. No. 732,463
Int. Cl.[2] G01J *1/20*
U.S. Cl. 250—203 R **1 Claim**



1. In a tracking apparatus for a solar energy collector in which there is provided, for each axis of tracking freedom, a reversible A.C. electric motor operatively connected to drive a pivotably mounted frame supporting the collector for tracking the same about the axis of said pivots, and wherein there is also provided for each said axis of tracking freedom a sensor and a motor control means and sources of electric power for operating said motor and control means, an improvement in the tracking sensor and motor control apparatus, comprising:

a source of pulsating D.C. electric power connected to each said sensor;

said sensors being light activated silicon control rectifiers;

inhibitory logic means for blocking the simultaneous passage of outputs from any two said sensors for opposite directions of control motor rotation, said logic means being connected to the outputs of said sensors which are used for controlling a given motor rotation for tracking said collector in a given plane and about a given axis, and said logic means also being connected to said source of pulsating D.C. power at only one of two outputs of said logic means at any one time in response to the illumination of said sensors connected thereto, thereby supplying pulsating D.C. power to control the operation of said motor in only one direction at any one time;

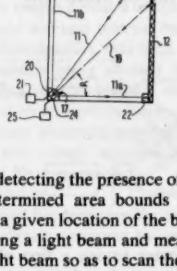
two triac A.C. power switching means connected to a source of A.C. electric power at the switched inputs thereof and, at the outputs thereof, to the inputs of said reversible A.C. motor for said given plane and axis of tracking, for said collector, the control inputs of said triacs being connected to the pulsating D.C. outputs of said inhibitory logic means so that both of said triacs may not be simultaneously switched on by the control outputs from said logic means, to provide a chopped A.C. power to said motor, and a phase reversing capacitance connected across the outputs of said triacs and the inputs of said motor, in parallel, to insure the proper direction of rotation of said motor in response to A.C. power supplied by one or the other of said triacs.

4,107,522

ROTARY BEAM LIGHT CURTAIN

Arthur Walter, Denzlingen, Germany, assignor to Erwin Sick Gesellschaft mit beschrankter Haftung Optik-Electronik, Germany

Filed Oct. 15, 1976, Ser. No. 732,559
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1975, 2550653
Int. Cl.[2] G01D *21/04*
U.S. Cl. 250—221 **24 Claims**



1. Aparatus for detecting the presence of an object in an area defined by predetermined area bounds comprising: a light source disposed at a given location of the bounds and including means for generating a light beam and means for changing the direction of the light beam so as to scan therewith the full area, whereby the light beam will impinge on the area bounds; a photo-sensitive device at the location for generating an output signal as a function of light received by the device; a first retroreflector placed along a portion of the bounds opposite the light source for reflecting at least part of the beam impinging thereon back to the device; a second retroreflector placed along another portion of the bounds spaced apart from the first mentioned portion thereon for likewise reflecting the beam impinging thereon back to the device; and mirror means placed along a third portion of the bounds intermediate the first and

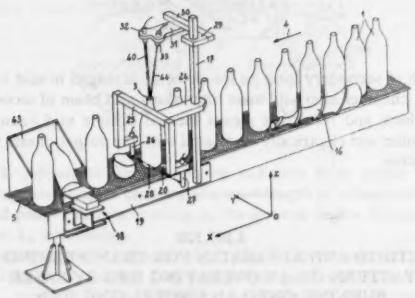
second portions and oriented relative to the second retroreflector for reflecting the light beam impinging thereon to the second retroreflector; whereby the retroreflectors reflect a directly impinging light beam from the source directly back to the device while a light beam from the source impinging on the mirror means is first directed to the second retroreflector which redirects such light beam via the mirror means to the device.

4,107,523

EQUIPMENT FOR AUTOMATICALLY MONITORING THE VERTICALITY OF BOTTLES

Guy Corman, Lyon, France, assignor to Boussois Souchon Neuvesel Gervais Danone (Societe Anonyme), Levallois-Perret, France

Filed Jan. 24, 1977, Ser. No. 762,172
Claims priority, application France, Jan. 26, 1976, 76 02486
Int. Cl.[2] G01D *21/04*
U.S. Cl. 250—223 B **11 Claims**



1. An apparatus for automatically monitoring the verticality of bottles, and more particularly cylindrical bottles with a small mouth, of the type where the bottles, previously sorted, are monitored by means of optical processes as they pass along a flat conveyor, comprising in combination:

an alignment device for the bottles effecting alignment thereof by the base of their body along a line parallel to the conveyor;

a first photoelectric locating device for transmitting a first signal when the base of the body of a bottle positioned by the aforementioned alignment device reaches a first optical beam perpendicular to the conveyor;

a second photoelectric detecting device for transmitting another optical beam oriented downwards and focused on a circular spot at the level of the top plane of a lip of the bottles and having a diameter less than the inside diameter of the said lip, the second device transmitting a second signal when a verticality defect of a bottle causes a reflection of said other optical beam on a flat annular part of its lip;

means responsive to this second signal only at the moment when the bottle reaches the first optical beam; and

an ejector designed to eliminate the defective bottles and controlled by the aforementioned means.

4,107,524

HIGH ATOMIC WEIGHT ISOTOPE SEPARATOR

David L. Book, 3001 Ordway St., Washington, D.C. 20008

Filed Dec. 4, 1975, Ser. No. 637,562
Int. Cl.[2] H01J *39/00*
U.S. Cl. 250—282 **3 Claims**

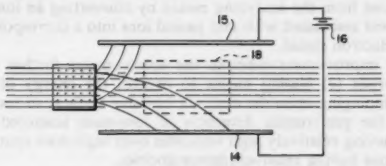
3. A method of separating an isotopic species of a given element from a mixture which comprises:

directing a first beam containing a mixture of isotopes toward an area bounded by spaced capacitor plates;

directing a second beam containing a mixture of isotopes toward said first beam to intersect said first beam at an angle relative thereto in an area bounded by said capacitor plates;

exciting and ionizing said first and second beams before intersection of said beams to form a plasma containing ions, electrons, and neutrals;

applying a magnetic field across the area bounded by said capacitor plates; and



applying a voltage source to said capacitor plates,

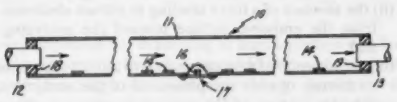
whereby ion scattering is induced by plasma instabilities in the area bounded by said capacitor plates, and said ions are collected by one capacitor plate, said electrons are collected by the other capacitor plate and said neutrals are recovered outside of said capacitor plates.

4,107,525

FLOWMETER DEVICE AND METHOD FOR DETERMINING VELOCITY OF A FLUID

Howard R. Hart, Jr., Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 4, 1976, Ser. No. 729,076
Int. Cl.[2] G01T *1/161*
U.S. Cl. 250—303 **6 Claims**



1. The method for determining the velocity of a fluid containing a known tracer substance having a known diffusion constant in said fluid, comprising the steps of:

conducting at least some of said fluid through a conduit for a preselected period of time,

detecting the pattern of movement of said tracer substance in terms of tracer density along said conduit under the combined influences of diffusion in, and transport by, the fluid, and

deriving from said information of tracer density the velocity of said fluid by (a) plotting the logarithm of the tracer density along said conduit as a function of distance, (b) calculating the scope of at least a portion of any resulting curve, and (c) determining the velocity from a calibration curve for said device specific to said preselected period of time plotted for velocity as a function of slope.

4,107,526

ION SCATTERING SPECTROMETER WITH MODIFIED BIAS

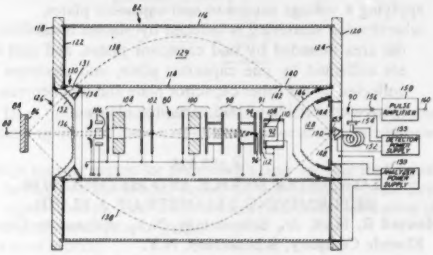
James T. McKinney, Stillwater, and Thomas W. Rusch, Falcon Heights, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 669,091, Mar. 22, 1976, abandoned. This application Jan. 12, 1977, Ser. No. 758,836
Int. Cl.[2] H01J *35/00*
U.S. Cl. 250—305 **10 Claims**

1. In an ion scattering spectrometer comprising

(a) means for supporting a specimen, a surface of which is to be analyzed,

(b) means for directing a beam of ions having a preselected atomic mass and a preselected energy toward the surface,
(c) analyzing means comprising an entrance section for receiving ions from the surfaces, analyzing section for selecting such ions passing through the entrance section at a given angle as have a predetermined energy, and an exit section for passing said selected ions, and
(d) detecting means comprising a material having an electron emissive surface for receiving and detecting passed ions from the analyzing means by converting an ion current associated with said passed ions into a corresponding electron signal,
the improvement wherein the spectrometer further comprises (e) biasing means to control the energy of ions impinging upon the electron emissive surface, to result in
(i) the preferential detection of low-mass scattered ions having relatively high velocities over high-mass sputtered ions having relatively low velocities,
and for maintaining a potential on said electron emissive



surface within 30 volts of that maintained on said exit section of the analyzer means resulting in
(ii) the absence of a force tending to attract electrons emitted from the emissive surface toward the analyzing means, and
(iii) the absence of a force tending to attract such ions having an energy outside the pass-band of the analyzer through the exit section of the analyzing means to the emissive surface, such that there is produced an appreciably stronger electron signal corresponding to scattered ions, and a corresponding reduction in the background of the electron signal corresponding to the detection of heavier sputtered ions and spurious scattered ions not within the pass-band of the analyzer, said detecting means further comprising means for indirectly coupling said electron signal from the output portion to an amplifier means operating near ground potential, such that said output section may be maintained at a positive potential to cause electrons emitted from said emissive surface to drift into the detecting means.

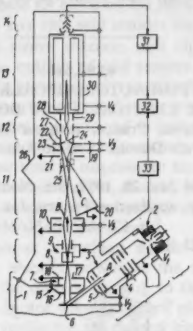
4,107,527

ION-EMISSION MICROANALYZER MICROSCOPE

Valentin Tikhonovich Cherepin, ulitsa Lenina, 42, kv. 30, and Valery Leonidovich Olkhovsky, prospekt Voroshilova, 17a, kv. 73, both of Kiev, U.S.S.R.

Filed Jul. 13, 1977, Ser. No. 815,443
Int. Cl.[2] H01J *37/26*
U.S. Cl. 250—309 **3 Claims**

1. An ion-emission microanalyzer microscope comprising: a vacuum chamber; an ion source for bombarding the surface of an object under investigation, and located in said vacuum chamber; a focusing system arranged in said vacuum chamber coaxially with a beam of primary ions emitted by said source; an immersion objective arranged in said vacuum chamber coaxially with said beam of secondary ions emitted by the bombarded surface of said object; an aperture diaphragm arranged in said vacuum chamber after said immersion objective along said beam of secondary ions; an ion-optical converter arranged in said vacuum chamber after said aperture diaphragm along said beam of secondary ions; a through opening in said ion-optical converter, coaxial with said beam of secondary ions; said opening performing the function of an aperture for separating an image element; a mass filter arranged in said vacuum chamber after said ion-optical converter along said



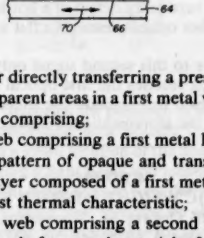
beam of secondary ions; an ion detector arranged in said vacuum chamber after said mass filter along said beam of secondary ions; and recording means located outside said vacuum chamber and electrically associated with the output of said ion detector.

4,107,528

METHOD AND APPARATUS FOR TRANSFERRING A PATTERN ON AN OVERLYING WEB BY LASER BURNING ONTO AN UNDERLYING WEB

Daniel Silverman, 5969 S. Birmingham St., Tulsa, Okla. 74105

Continuation-in-part of Ser. No. 498,954, Aug. 20, 1974, Pat. No. 3,979,591, which is a continuation-in-part of Ser. No. 262,290, Jun. 13, 1972, Pat. No. 3,832,547. This application Aug. 5, 1976, Ser. No. 712,009
The portion of the term of this patent subsequent to Aug. 27, 1991, has been disclaimed.
Int. Cl.[2] G01D *15/10*
U.S. Cl. 250—317 **21 Claims**



1. A system for directly transferring a preselected pattern of opaque and transparent areas in a first metal web to an underlying second web, comprising;
(a) a master web comprising a first metal layer carrying said preselected pattern of opaque and transparent areas, said first metal layer composed of a first metal, of a first thickness, of a first thermal characteristic;
(b) a facsimile web comprising a second layer, said second layer composed of a second material, of a second thickness of a second thermal characteristic;
(c) means to superimpose said master web in fixed relation on said facsimile web;
(d) optical means to focus a continuous beam of laser radiation of a selected constant level of intensity, and to direct said beam onto the surface of said master web, and means to relatively move said beam of laser radiation over sub-

stantially the entire area of said pattern on said master web at a selected velocity; and wherein

(e) said first metal has a higher melting point than the melting point of said second material;

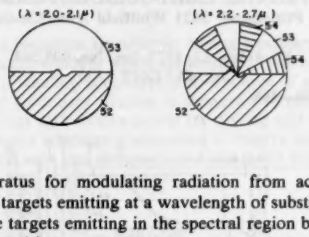
whereby said focussed beam will penetrate said transparent areas in said master web and will irradiate said second layer below, and will burn areas in said second layer in a second pattern which is substantially similar to said first pattern.

4,107,529

DUAL MODE SEEKER RETICLE

Evan P. Chicklis, Nashua, N.H.; Charles S. Naiman, Brookline, Mass., and Kenneth D. Labaugh, Wilton, N.H., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Jun. 13, 1977, Ser. No. 805,669
Int. Cl.[2] G01J *1/00*; G05D *25/00*
U.S. Cl. 250—339 **9 Claims**



1. Apparatus for modulating radiation from active laser designated targets emitting at a wavelength of substantially λ_1 and passive targets emitting in the spectral region between λ_2 and λ_3, comprising:

a single reticle responsive to radiation from targets;

said reticle having first and second portions, each of said portions having a different transmissivity characteristics for radiation at λ_1 and radiation between λ_2 and λ_3; and

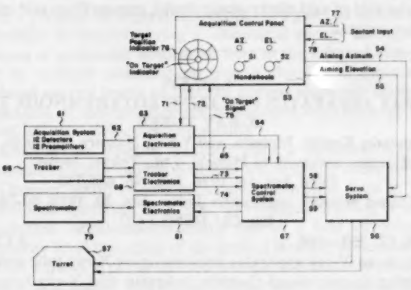
said reticle providing a similar output for radiations at λ_1 and radiations between λ_2 and λ_3.

4,107,530

INFRARED ACQUISITION DEVICE

Elvin S. Brumfield, Los Angeles; Edgar W. Kutzscher, Sherman Oaks, and James N. Lovelady, Saugus, all of Calif., assignors to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Jan. 26, 1966, Ser. No. 523,179
Int. Cl.[2] G01J *1/20, 1/00*
U.S. Cl. 250—342 **10 Claims**



1. Acquisition apparatus responsive to an infrared emissive target within a given field of view, comprising:

a first array of infrared energy responsive detectors radially disposed in a common plane about a common center;

a second array of infrared energy responsive detectors annularly disposed with respect to said first array of detectors and coplanar therewith;

optical means for collecting and focusing infrared energy from said given field of view onto an image plane coplanar with said first and second arrays of detectors;

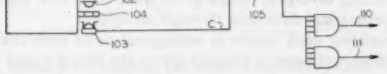
positioning means movably carrying said optical means and responsive to signals generated by infrared energy from said target impinging upon a detector of said second array to reposition said optical means to cause the energy from said target to be directed onto a detector of said first array and away from a detector of said second array.

4,107,531

X-RAY BODY SCANNER USING ENCODER FOR GENERATING SYSTEM CONTROLLING TIMING PULSE TRAIN

Philip Melvin Garratt, Amsterdam; Leroy Earl Foley, Schenectady, both of N.Y.; Robert Godbarsen, Elm Grove, and David M. Barrett, Brookfield, both of Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 16, 1976, Ser. No. 723,799
Int. Cl.[2] A61B *6/02*; G01N *23/08*; H05G *1/30*
U.S. Cl. 250—360 **21 Claims**



1. X-ray apparatus for examining at least a portion of a body by scanning successive layers of said body with a rotating x-ray beam and detecting the x-radiation along the beam that emerges from each body layer as it is scanned, comprising:

rotatable means that are rotatable through substantial angles about a longitudinal axis that is substantially normal to the layers of the body portion to be examined,

x-ray source means having a fixed focal spot from which an x-ray beam originates and x-ray detector means mounted on said rotatable means and spaced angularly relative to each other about said axis and being on opposite sides of said axis for orbiting jointly about a body portion when it is disposed between said source and detector means, the relationship between said focal spot, said axis and said detector means being unaltered during said orbiting,

means cooperating with said source means for defining the radiation emanating from said source means into a beam that is directed toward said detector means,

motor means operatively coupled with said rotatable means for driving said rotatable means to effect scanning of a body portion solely by said joint orbiting of said focal spot and detector means,

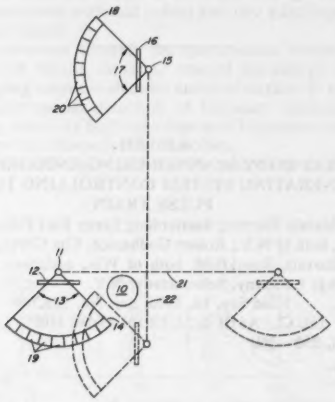
means for maintaining functions of said apparatus in predetermined relationships comprising encoder means having shaft means coupled to said rotatable means and including means responsive to rotation of said shaft means by producing a train of timing pulses in which each pulse corresponds with a fractional degree of rotation of said rotatable means, and

means responsive to occurrence of successive predetermined numbers of said timing pulses by controlling said x-ray source means to turn on for the duration of a predetermined number of timing pulses, to thereby provide x-radiation pulses at repeatable angular increments of said rotatable means.

4,107,532
ORTHOGONAL SCAN COMPUTERIZED TOMOGRAPHY

Albert MaCovski, Palo Alto, Calif., assignor to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Nov. 11, 1976, Ser. No. 741,127
Int. Cl.[2] A61B *6/02*; G01N *23/08*
U.S. Cl. 250—360 **24 Claims**

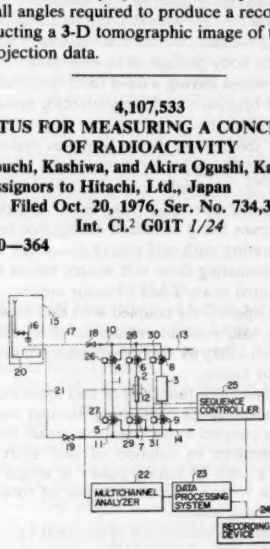


1. In a method of computerized tomography the steps of:
directing divergent beams of radiation from two sources in orthogonal directions through an object;
translating each source in orthogonal paths such that each divergent beam is scanned across the lateral extent of the region of the object being examined;
detecting the radiation that is transmitted through the object at each of a plurality of positions within the angle subtended by each of the divergent beams at each source position to derive projection data representing substantially all angles required to produce a reconstruction; and
reconstructing a 3-D tomographic image of the object from the projection data.

4,107,533
APPARATUS FOR MEASURING A CONCENTRATION OF RADIOACTIVITY

Hideho Tabuchi, Kashiwa, and Akira Ogushi, Kawasaki, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 20, 1976, Ser. No. 734,318
Int. Cl.[2] G01T *1/24*
U.S. Cl. 250—364 **22 Claims**

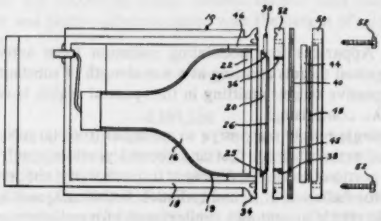


1. An apparatus for automatically measuring concentration of radioactivity in a radioactive fluid comprising:
at least two sampling tubes of different cross sectional areas connected to a fluid system in which the radioactive fluid flows,
valve means provided at inlet and outlet sides of said at least two sampling tubes for selectively feeding to said at least two sampling tubes one of the radioactive fluid and a non-radioactive fluid,
control means for controlling said valves to permit the radioactive fluid to be fed to at least two sampling tubes,
radiation detector means responsive to the radioactive fluid in said at least two sampling tubes for detecting the radiation from the fluid and providing a radiation output signal in accordance therewith, and
processing means responsive to the radiation signal of said radiation detector means for providing at least an indication of the concentration of radioactivity in the radioactive fluid.

4,107,534
PLUTONIUM-AMERICIUM DETECTION PROBE WITH FRONTAL LIGHT-GUIDE-DIFFUSER

Harley V. Piltingsrud, 3431 Whitfield Ave., Cincinnati, Ohio 45220

Filed Jun. 13, 1977, Ser. No. 805,664
Int. Cl.[2] G01T *1/20*
U.S. Cl. 250—368 **5 Claims**



1. A detector probe for a scintillation detector instrument, comprising: metal housing; an end window type photomultiplier tube within said housing; an europium activated calcium fluoride scintillation crystal; means for coupling said crystal to the end window of the photomultiplier tube; a light impervous, reflective electrostatic shield on the side of said crystal remote from said photomultiplier tube; means for providing a light guide diffuser between the electrostatic shield and the photomultiplier on the side of the scintillation crystal remote from said photomultiplier and a radioactive contamination barrier on the side of said electrostatic shield, remote from said scintillation crystal.

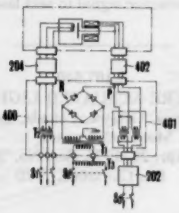
4,107,535
X-RAY APPARATUS UTILIZING ROTARY ANODE TYPE X-RAY TUBES

Munenori Kotabe, Mobara, and Yasuji Nomura, Matsudo, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 16, 1976, Ser. No. 696,753
Claims priority, application Japan, Jun. 20, 1975, 50-74474
Int. Cl.[2] H05G *1/70*
U.S. Cl. 250—406 **5 Claims**

1. In an X-ray apparatus comprising an X-ray tube unit and driving source means therefor, wherein said X-ray tube unit includes a rotary anode type X-ray tube with an anode electrode having a target adapted to generate X-rays and a rotor for rotating said anode electrode, said anode electrode being rotatably supported in an envelope, and with a cathode electrode having at least one filament which is disposed in said envelope to oppose said target, and includes a stator positioned on the outside of said envelope and provided with stator windings for generating a magnetic field for rotating said rotor; and said driving source means includes means for impressing a

voltage across said filament, means for impressing a predetermined negative high potential upon said cathode electrode, means for impressing a predetermined positive high potential upon said anode electrode, and means for impressing a low motive power potential difference at high potential across the terminals of said stator windings, the improvement wherein said means for impressing the low potential difference at high potential across the terminals of said stator windings includes a



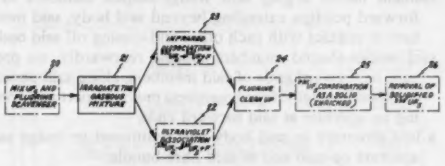
high voltage insulation transformer having a primary winding and a secondary winding which are insulated from each other, said primary winding is connected to a source of alternating current, said secondary winding is connected to energize said stator windings with motive power for driving said rotor, and one of the stator windings is connected to receive said positive high potential such that said anode and said stator windings are at the same high positive potential.

4,107,536

METHOD FOR ISOTOPE-SELECTIVE VIBRATIONAL EXCITATION OF A GASEOUS COMPOUND OF AN ISOTOPE USING MULTIPLE WAVELENGTHS

Richard L. St. Peters, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 21, 1974, Ser. No. 499,170
Int. Cl.[2] H01J *39/34*
U.S. Cl. 250—423 P **16 Claims**



1. In a process for separating isotopes in a gaseous mixture of polyatomic molecules having a vibrational energy absorption spectrum of molecular absorption lines in the infrared complicated by multiple contributions from a plurality of thermally populated energy levels so that the isotope shifts are masked, the method of isotope-selective vibrational excitation of the desired isotopic molecules comprising

irradiating the gaseous mixture from a radiation source means emitting radiation of line width of the order of the Doppler width of said molecular absorption lines in the infrared spectrum at a first wavelength defining a first selected vibrational-rotational line of a first vibrational energy level transition of the desired isotopic molecules so that a fraction of the desired isotopic molecules are raised to a first higher vibrational energy level whereas a fraction of the undesired isotopic molecules may also be raised to a first higher vibrational energy level, and

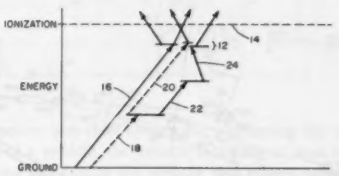
irradiating the gaseous mixture from a radiation source means emitting radiation of line width of the order of the Doppler width of said molecular absorption lines in the infrared spectrum at a second wavelength different from the first wavelength and defining a second selected vibrational-rotational line of a second vibrational energy level transition of the desired isotopic molecules so that a substantial portion of the fraction of desired isotopic molecules raised to the first higher vibrational energy level are raised to a second vibrational energy level higher than the first whereas the undesired isotopic molecules that were raised to the first higher vibrational energy level are not raised to a second higher vibrational energy level higher than the first except those that may be so excited due to an accidental coincidence of an absorption line with the second wavelength so that the desired isotopic molecules are vibrationally excited to an energy level substantially unpopulated by the undesired isotopic molecules.

4,107,537

MULTIPLE PARTICLE TYPE INTERACTION ISOTOPICALLY SELECTIVE IONIZATION

Harold K. Forsen, Bellevue, Wash.; George Sargent Janes, Lincoln, and Richard H. Levy, Boston, both of Mass., assignors to Jersey Nuclear-Avco Isotopes, Inc., Bellevue, Wash.

Continuation of Ser. No. 469,407, May 13, 1974, abandoned.
This application Oct. 12, 1976, Ser. No. 731,587
Int. Cl.[2] H01J *39/34*
U.S. Cl. 250—423 P **39 Claims**



1. A method for ionizing particles of one isotope type in an environment of plural isotope type particles comprising the steps of:

generating a vapor environment of particles of said plural isotope types, said vapor environment generating step including the step of generating energetic electron particles;

exciting the particles of said one isotope type to an excited state which is below the ionization level of the particles of said one isotope type by a small fraction of the ionization potential of said one isotope type;

the excitation of the particles of said one isotope type being isotopically selective with respect to that one isotope type so as not to correspondingly excite particles of other isotope types in said environment;

the excitation of the particles of said one isotope type being to an energy level from which ionization occurs in response to collision between the particles of said one isotope type and the energetic electron particles of said environment.

4,107,538

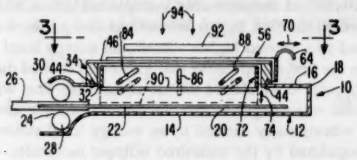
CASSETTE FOR PORTABLE X-RAY CAMERA

Toshio Zenitani, Nara, Japan, assignor to International Med-Electronics, Inc., San Mateo, Calif. and Heiwa Electronic Industrial Co., Japan

Filed Dec. 8, 1976, Ser. No. 748,435
Int. Cl.[2] G03B *41/16*
U.S. Cl. 250—480 **12 Claims**

1. A cassette for use with a portable X-ray machine comprising a light-tight housing having a film-receiving space therewithin and an open end for permitting insertion of a photographic film in the space, said housing having a pair of opposed sidewalls, one of the sidewalls having an opening therethrough; an illumination screen; means coupled to said one sidewall and moveable at least partially through the opening

for mounting the screen for movement along a path into and out of a position contiguous to a film in the space; and means



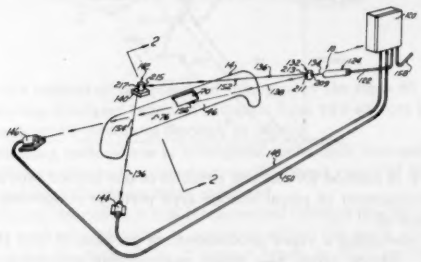
coupled with said mounting means for moving said screen along said path into and out of said position.

4,107,539

LASER WORKPIECE POSITION AND PRESENCE INSPECTOR AND MACHINE CONTROL GOVERNOR

Jerry Kirsch, 36 Beacon Hill, Grosse Pointe Farms, Mich. 48236

Filed Mar. 16, 1977, Ser. No. 777,901
Int. Cl.[2] G01N *21/30*
U.S. Cl. 250—561 **6 Claims**



1. A laser-operated workpiece position and presence inspector for a workpiece shape-altering machine having a workpiece supporting member thereon and an electrical control circuit therefore, said inspector comprising

a laser energization and control unit adapted to be electrically connected to the machine control circuit in operation-governing relationship therewith,

a laser beam generator electrically connected to said laser energization and control unit and constructed and arranged to emit an outgoing laser beam;

a laser beam splitter optically aligned with said outgoing laser beam and constructed and arranged to divide said outgoing laser beam into an emitted workpiece position-indicating laser beam and an emitted workpiece presence-indicating laser beam,

said beam splitter being positioned to project said workpiece position-indicating beam across a workpiece properly disposed upon said workpiece supporting and forming member in approximately grazing relationship with the workpiece,

said beam splitter being also positioned to project said emitted workpiece presence-indicating beam against a workpiece present on said workpiece supporting member in obstructed relationship with the workpiece but unobstructed in the absence of a workpiece on said member,

a workpiece position-indicating laser beam detector optically aligned with said workpiece position-indicating laser beam and electrically connected to said laser energization and control unit in communicating relationship therewith,

and a workpiece presence-indicating laser beam detector optically aligned with said emitted workpiece presence-indicating laser beam in the absence of a workpiece on said member,

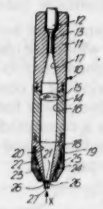
said laser energization and control unit being responsive to the interruption of signals from said workpiece position-indicating laser beam detector for transmitting an improper workpiece position signal to said laser energization and control unit, and also being responsive to the interruption of signals from said workpiece presence-indicating laser beam detector for transmitting a proper workpiece presence signal to said laser energization and control unit.

4,107,540

PRESSURE ACTUATED LIGHT PEN

Garth Decker Hillman, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Apr. 25, 1977, Ser. No. 790,264
Int. Cl.[2] G06K *7/10*
U.S. Cl. 250—566 **6 Claims**



1. A pressure actuated light pen, comprising:

a tubular body having front and rear end parts;

means for connecting one end of an optical fibre bundle to said rear part, the end of said bundle at a predetermined position in said body;

means supporting a plurality of wedge-shaped members side-by-side in said front part for sliding movement in a conical path;

resilient means urging said wedge-shaped members to a forward position extending beyond said body, said members in contact with each other and closing off said body;

said wedge-shaped members slidable rearwardly, on pressure on forward ends of said members, along said conical path, said wedge-shaped members moving apart and opening an aperture at said forward ends;

a lens structure in said body and positioned to image said aperture on said end of said fibre bundle;

a light image at said aperture focussed on said end of the fibre bundle when said wedge-shaped members are moved rearwardly and said aperture is at a predetermined position.

4,107,541

WORKPIECE HOLE PRESENCE AND ABSENCE INSPECTOR

Jerry Kirsch, 36 Beacon Hill, Grosse Pointe Farms, Mich. 48236

Filed Mar. 4, 1977, Ser. No. 774,601
Int. Cl.[2] G11B *1/00*
U.S. Cl. 250—571 **10 Claims**

1. A laser-operated hole presence and absence inspector for a workpiece containing multiple intendedly-formed spaced holes therethrough as produced by a hole-forming machine, said inspector comprising

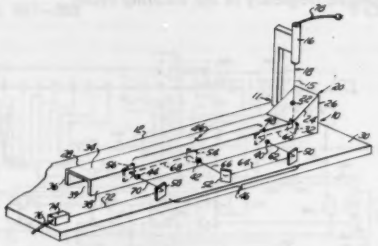
laser inspector supporting structure having a workpiece rest thereon,

a laser beam source mounted on said supporting structure,

a laser beam transmitting and reflecting system disposed adjacent and in alignment with the intended locations of the holes in the workpiece and including a multiplicity of laser beam reflectors and passageway means therebetween

constructed and arranged to reflect a multiplicity of laser beam portions along an optical path having corresponding portions disposed angularly relatively to one another,

said reflectors being positioned to reflect said laser beam portions through the workpiece holes and from hole to hole thereof and to emerge from the final hole in said optical path,



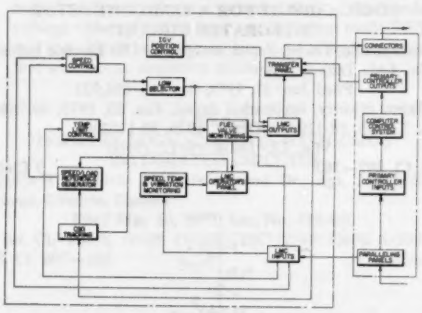
a laser beam sensor disposed in alignment with the emergent portion of said laser beam from said final hole and responsive to its detection of said emergent portion of said laser beam for indicating an all hole formation in the workpiece and responsive to the non-detection of said emergent portion of said laser beam for indicating the blocking thereof by the non-formation of at least one of said holes.

4,107,542

TIME DELAYED RELAY SEQUENCER AND ALARM RESET FOR A GAS TURBINE LOCAL MAINTENANCE CONTROLLER

Richard S. Heiser, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 19, 1975, Ser. No. 551,204
Int. Cl.[2] H02P *9/04*
U.S. Cl. 290—40 R **9 Claims**



1. For a gas turbine power plant having a primary control system which develops a control signal output utilized to regulate fuel flow to the turbine, the plane including a generator drivably coupled to the turbine, a breaker for connecting the generator to an external power line and a plurality of plant sensors for generating signals indicating the status of predetermined plant parameters and operating status conditions, backup control apparatus for regulating fuel flow to the turbine when the primary control system is down comprising:

(a) a first circuit portion and a second circuit portion;

(b) input means coupled to receive the information signals from the plant sensors;

(c) means for energizing said first portion of said backup control apparatus in a first condition of operation and for energizing said second portion of said backup control apparatus in a second condition of operation;

(d) a plurality of alarm reset circuit means, cooperably coupled to said means for energizing and said input means; and

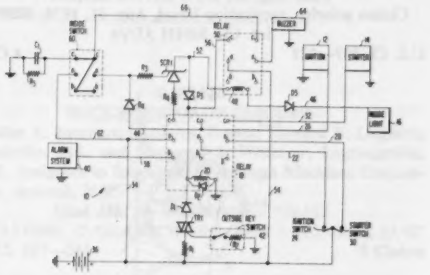
(e) means for resetting said alarm circuit means when said means for energizing is switched from said first condition of operation to said second condition of operation and while said means for energizing is still in said first condition of operation.

4,107,543

VEHICLE ANTITHEFT SYSTEM

Neil B. Kaplan, 63 Mary St., Quincy, Mass. 02169

Filed Mar. 21, 1977, Ser. No. 779,478
Int. Cl.[2] B60R *25/10*
U.S. Cl. 307—10 AT **13 Claims**



1. A passive anti-theft system for preventing the unauthorized use of a vehicle, the vehicle including at least one door for entering and exiting the vehicle, said system comprising:

A. switchable control means for controlling use of the vehicle, said switchable control means including a first position in which use of the vehicle is prevented and a second position in which use of the vehicle is enabled, said switchable control means normally being in said first position thereby to prevent use of the vehicle;

B. means actuatable by an authorized user prior to using the vehicle for switching said switchable control means to its second position thereby to enable use of the vehicle; and

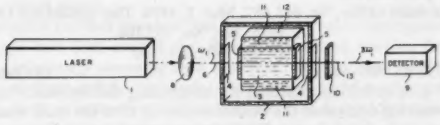
C. automatic arming means responsive to the closing of the vehicle door when the user exits the vehicle for switching said switchable control means back to its first position thereby to again prevent use of the vehicle, whereby said system is automatically armed and the vehicle is automatically protected upon the closing of the vehicle door without the need for any additional action on the part of the user.

4,107,544

TWO-PHOTON RESONANT LASER MIXING IN MOLECULAR LIQUIDS

Helge Kildal, and Steven R. J. Brueck, both of Acton, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed May 5, 1977, Ser. No. 794,328
Int. Cl.[2] H03F *7/00*
U.S. Cl. 307—88.3 **24 Claims**



1. A coherent frequency source comprising:

a first molecular liquid,

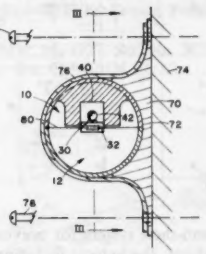
means for minimizing optical inhomogeneities in said liquid,
a first input laser,
the frequency of said laser being substantially one-half a molecular vibrational two-photon resonance frequency of said liquid,
a means for passing the beam of said first laser through said liquid,
the output beam from said liquid containing a component at a frequency equal to the third harmonic of the frequency of said first laser.

4,107,545

MOUNTING CONSTRUCTION FOR MOTION SENSOR

Meir Gittelis, Moshav Bnei Atarot, Israel, assignor to Nahshol Electronics Ltd., Moshav Bnei Atarot, Israel

Filed Aug. 30, 1977, Ser. No. 829,184
Claims priority, application Israel, Aug. 31, 1976, 50389
Int. Cl.[2] H01H *35/14*
U.S. Cl. 307—121 **4 Claims**



1. Mounting means for a sensor including
three conductive points respectively insulated from one another;
a movable conductive element normally resting in contact with said points and thus producing an electrical interconnection therebetween and being displaceable out of contact with at least one of said points in response to the application of a predetermined force; and
means for connecting said three points to logic circuitry for sensing interruption of said electrical interconnection and determining in response thereto whether an alarm condition exists; said mounting means comprising:
a housing containing said sensor and having an outer configuration which includes a spherical portion;
means fixedly mountable onto an article and defining a socket surface complementary to said spherical portion; and
clamp means for selectably attaching said housing to said mounting means and permitting ready adjustment of the orientation of said spherical portion with respect to said complementary socket portion with two degrees of freedom to enable precise angular orientation of said sensor with respect to said article.

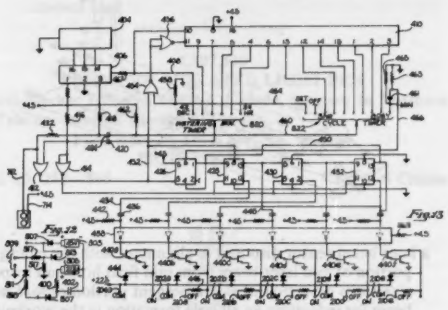
4,107,546

FLUID CONTROL SYSTEM AND CONTROLLER AND MOISTURE SENSOR THEREFOR

Oded E. Sturman, and Benjamin Grill, both of Northridge, Calif., assignors to Clifton J. Burwell, Northridge, Calif., a part interest

Division of Ser. No. 662,682, Mar. 1, 1976. This application Oct. 13, 1976, Ser. No. 732,106
Int. Cl.[2] H01H *43/00*
U.S. Cl. 307—141 **10 Claims**

1. A sprinkler controller for controlling the frequency of a watering cycle and the desired watering time for each watering cycle for at least a first valve comprising:
a reference oscillator for providing a reference frequency;
means for counting down said reference frequency to provide a plurality of subfrequencies of said reference frequency;
first selection means for selecting one of a first predetermined group of said subfrequencies dependent upon the desired water time;
second selection means for selecting one of a second predetermined group of said subfrequencies dependent upon the desired frequency of the watering cycle;



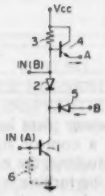
counter means coupled to said first and second selection means, said counter means being means enabled by a signal from said second selection means to count through a predetermined count at a rate responsive to the signal received by said first selection means; and
output means coupled to said counter means and responsive to said count to provide a plurality of successive drive signals for controlling at least one sprinkler valve.

4,107,547

LOGIC CIRCUIT FOR A SEMICONDUCTOR INTEGRATED CIRCUIT

Hiroshi Ishino, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Jun. 11, 1976, Ser. No. 694,921
Claims priority, application Japan, Jun. 23, 1975, 50-75449; Oct. 7, 1975, 50-120289; Oct. 7, 1975, 50-120290
Int. Cl.[2] H03K *19/12, 19/08*
U.S. Cl. 307—203 **9 Claims**

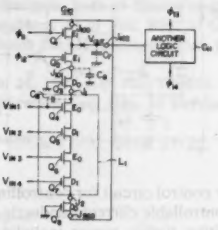


1. A basic logic circuit, wherein the collector of a first transistor which has an emitter which is connected to ground is connected to the base of a second transistor having at least one emitter and to the power source through a resistance component, the base of said first transistor is connected to an input terminal as well as to ground through a first resistor, the collector of said second transistor is connected to said power source, each of said emitters of said second transistor provides a first output signal, while to the collector of said first transistor is connected the cathode of at least one diode, and each of the anodes of said diodes provides a second output signal.

4,107,548
RATIOLESS TYPE MIS LOGIC CIRCUIT

Hiroo Sakaba, Kodaira, and Kenzo Masuda, Tokorozawa, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 4, 1977, Ser. No. 774,540
Claims priority, application Japan, Mar. 5, 1976, 51-23333; Mar. 5, 1976, 51-23334
Int. Cl.[2] H03K *19/08, 19/20;* G11C *17/04*
U.S. Cl. 307—205 5 Claims

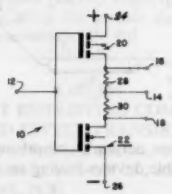


1. A ratioless type MIS logic circuit comprising:
at least one input terminal and an output terminal;
a logic block including at least one depletion mode FET having its gate connected with said input terminal and inherently having a gate-to-source parasitic capacitance and a gate-to-drain parasitic capacitance;
an output capacitance connected between said output terminal and a reference potential source;
means arranged for precharging said output capacitance;
means for sensing the logical state of said logic block, said precharging means and said sensing means being operative in a timed relation with each other; and
first and second depletion mode FETs connected with one end and the other end of said logic block, repsectively, for suppressing electrical energy which tends to be fed back from said output terminal to said input terminal through said parasitic capacitances, the gates of said first and second suppressing depletion mode transistors being connected with said reference potential source, the threshold voltage value of said at least one depletion mode FET in said logic block being larger than those of said suppressing first and second depletion mode FETs.

4,107,549
TERNARY LOGIC CIRCUITS WITH CMOS INTEGRATED CIRCUITS

Hussein T. Moufah, 3480 Havenwood Dr., Apt. 203, Mississauga, Ontario, Canada

Filed May 10, 1977, Ser. No. 795,441
Int. Cl.[2] H03K *19/08, 19/20;* G11C *11/40;* H03K *3/353*
U.S. Cl. 307—205 12 Claims

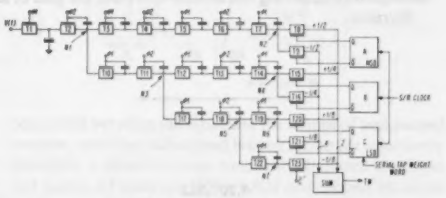


1. A three-valued logic operator having discrete positive, zero and negative output signal values for discrete negative, zero and positive input signal values, respectively, comprising:
an input terminal connected to the gates of a pair o complementary p-type and n-type metal oxide semiconductor devices, at least the sources of which are each respectively connected to equal and opposite power supplies of positive and negative value, respectively, and the drains of which are each connected to one of a pair of equal-valued resistors;
said pair of equal-valued resistors having a common connection to each other at the ends of each opposite the drains of the respective p-type and n-type metal oxide semiconductor devices; and
a first output terminal connected to the common connection of said pair of equal-valued resistors; whereby for each of said positive and negative input signal values, only one of said semiconductor devices is conductive to produce the respective output signal value; and when the input signal value is at the zero level, both of said semiconductor devices are conductive.

4,107,550
BUCKET BRIGADE CIRCUITS

Christian A. Jacquart, Gattieres, France; Howard N. Leighton, Rockville, Md., and Raymond J. Wilfinger, Lagrangeville, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 19, 1977, Ser. No. 760,612
Int. Cl.[2] G08C *15/00;* G11C *19/00;* G06G *7/625;* H03K *13/02*
U.S. Cl. 307—241 5 Claims

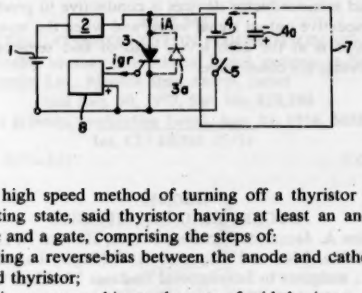


1. A binary-weighted signal attenuator, comprising:
a first series array of charge transfer devices, having an input device connected to an input signal, and organized into sequentially connected stages of charge transfer devices with charge division output nodes at each stage, terminating with a first gated output device, for propagating one half the magnitude of said input signal;
a second series array of charge transfer devices, having an input device connected to a first one of said output nodes of said sequentially connected stages of said first series array, and organized into sequentially connected stages of charge transfer devices with charge division output nodes at each stage, terminating with a second gated output device, for propagating one fourth the magnitude of said input signal;
a third series array of charge transfer devices, having an input device connected to a first one of said output nodes of said sequentially connected stages of said second series array, and organized into sequentially connected stages of charge transfer devices with charge division output nodes at each stage, terminating with a third gated output device, for propagating one eighth the magnitude of said input signal;
a signal summer having a first input connected to the outputs of said first, second and third gated output devices, for selectively summing as a first sum, one half, one fourth and one eighth magnitudes of said input signal in response to the selectively gated states of said first, second and third gated output devices, respectively;
whereby selective binary weighted attenuation of said input signal is achieved.

4,107,551
THYRISTOR TURN-OFF SYSTEM

Masahiko Akamatsu, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 545,906, Jan. 31, 1975, abandoned. This application Jun. 21, 1976, Ser. No. 698,112
Claims priority, application Japan, Apr. 17, 1973, 48-43392
Int. Cl.[2] H03K *17/72*
U.S. Cl. 307—252 J 7 Claims



1. A high speed method of turning off a thyristor in the conducting state, said thyristor having at least an anode, a cathode and a gate, comprising the steps of:

applying a reverse-bias between the anode and cathode of said thyristor;

applying a reverse-bias to the gate of said thyristor;

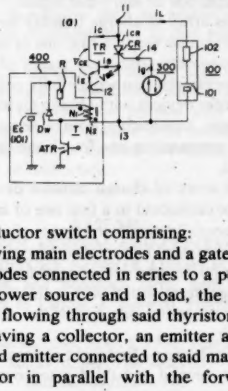
applying a forward-bias between the anode and cathode of said thyristor while continuing to apply the reverse-bias to the gate of said thyristor; and

subsequently removing the reverse-bias from the gate of said thyristor.

4,107,552
SEMICONDUCTOR SWITCH

Masahiko Akamatsu, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 22, 1976, Ser. No. 743,671
Claims priority, application Japan, Jan. 12, 1976, 51-2574
Int. Cl.[2] H03K *17/72*
U.S. Cl. 307—252 J 6 Claims



1. A semiconductor switch comprising:

a thyristor having main electrodes and a gate electrode, said main electrodes connected in series to a power path connecting a power source and a load, the current in said power path flowing through said thyristor;

a transistor having a collector, an emitter and a base, said collector and emitter connected to said main electrodes of said thyristor in parallel with the forward direction thereof;

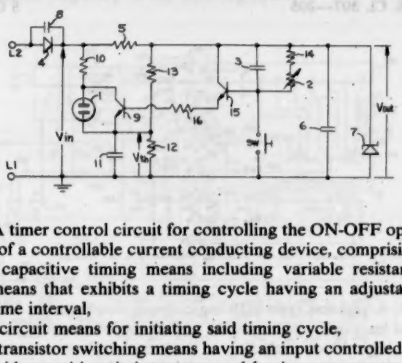
a pulsing means for generating a commutating pulse to reverse bias said main electrodes of said thyristor through said collector and emitter of said transistor; and

wherein said pulsing means is connected in series with said collector and emitter of said transistor.

4,107,553
TIMER CONTROL CIRCUIT

Robert A. Carter, Asheboro, N.C., assignor to General Electric Company, Bridgeport, Conn.

Filed Apr. 25, 1977, Ser. No. 790,294
Int. Cl.[2] H03K *17/30*
U.S. Cl. 307—293 10 Claims



1. A timer control circuit for controlling the ON-OFF operation of a controllable current conducting device, comprising:

(a) capacitive timing means including variable resistance means that exhibits a timing cycle having an adjustable time interval,

(b) circuit means for initiating said timing cycle,

(c) transistor switching means having an input controlled by said capacitive timing means and having an output coupled to said controllable device for switching said device in and out of the circuit in accordance with said timing cycle, the switching means including first and second transistors connected in a current gain relationship with their base emitter circuits in series,

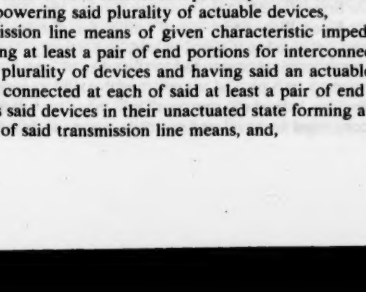
(d) means for developing a threshold voltage, including a voltage divider resistance means, the first transistor having its emitter connected to an intermediate point on the voltage divider resistance means, and

(e) means including said transistor switching means for feeding back said threshold voltage to said capacitive timing means, whereby said time interval is determined by said threshold voltage in combination with the setting of said variable resistance means.

4,107,554
DATA BUS ARRANGEMENT FOR JOSEPHSON TUNNELING DEVICE LOGIC INTERCONNECTIONS

Ying Luh Yao, Mahopac, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1976, Ser. No. 701,399
Int. Cl.[2] H03K *3/38, 19/195*
U.S. Cl. 307—306 22 Claims



1. A data distribution network comprising:

a plurality of actuable devices having an actuated and unactuated state,

means connected to each of said plurality of actuable devices for powering said plurality of actuable devices,

transmission line means of given characteristic impedance having at least a pair of end portions for interconnecting said plurality of devices and having said an actuable device connected at each of said at least a pair of end portions said devices in their unactuated state forming a portion of said transmission line means, and,

separately actuable means coupled to each of said plurality of devices for selectively actuating said plurality of devices to provide a pulse of electromagnetic energy from one of said actuable devices in said actuated state to the remainder of said actuable devices in the unactuated state via said transmission line means.

4,107,555

PROXIMITY SWITCH AND CIRCUIT SYSTEM

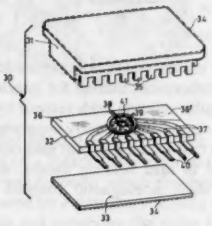
Lothar Haas; Rolf Bräutigam, both of Nuremberg, and Albert Weckenmann, Ahrensburg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 24, 1977, Ser. No. 771,806

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1976, 2609077

Int. Cl.[2] H03K *17/00;* **G01R** *27/26*

U.S. Cl. 307—308 **15 Claims**



1. Proximity switch and circuit system having
an insulating substrate (**11, 32**);
two surface electrodes (**13, 13'**; **36, 36'**) on the substrate insulated from each other, one electrode forming a transmitting electrode and the other a receiving electrode to receive radiation transmitted from the transmitting electrode;
an electrically floating metallic shield (**15, 34**) covering the electrodes and insulated therefrom and from ground,
whereby at least a portion of the field upon transmission of radiation by the transmitting electrode will pass through the shield to affect the receiving electrode and, upon approach in the proximity of the shield (**15, 34**) or contact therewith of a grounded mass, the field passing through the shield will change, thus changing the received radiation and providing, in the receiving electrode, a proximity sensing signal
comprising, in accordance with the invention
an integrated circuit (IC) element (**17, 38**) located beneath the metallic shield (**15**), the IC element being secured to the insulating substrate (**11, 32**) to which the surface electrodes are also secured;
terminals (**19, 40**) secured to the substrate (**11, 32**);
and connection means (**18, 37**) respectively connecting the IC element (**17, 38**) to the surface electrodes (**13, 13'**; **36, 36'**) and to the terminals (**19, 40**).

4,107,556

SENSE CIRCUIT EMPLOYING COMPLEMENTARY FIELD EFFECT TRANSISTORS

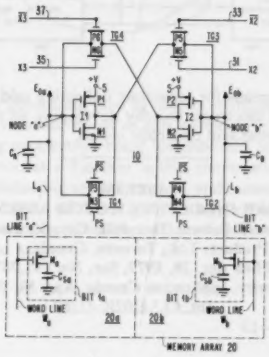
Roger Green Stewart, Neshanic Station, and Sargent Sheffield Eaton, Jr., Phillipsburg, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed May 12, 1977, Ser. No. 796,334

Int. Cl.[2] H03K *5/18;* **G11C** *7/06;* **H03K** *3/353, 3/286*

U.S. Cl. 307—362 **8 Claims**

1. A sense amplifier comprising:
first and second nodes;
means for applying signals to said first and second nodes;
first and second inverters, each inverter having an input, an output, and first and second power terminals for the application thereto of first and second operating voltages, respectively; each inverter comprising respective first and second transistors of complementary conductivity type and being responsive to a first level at its input for clamping its output to the voltage at said first power terminal via its first transistor conducting in the common source mode, and being responsive to a second level at its input for clamping its output to the voltage at said second power terminal via its second transistor conducting in the common source mode;
means connecting the input of said first inverter to said first node, and means connecting the input of said second inverter to said second node;
a first biasing means connected between the input and the output of said first inverter, and a second biasing means



connected between the input and the output of said second inverter, said first and second biasing means for selectively providing a direct current connection between the input and output of each one of said first and second inverters and biasing them at first and second quiescent points, respectively; and
first and second selectively enabled cross coupling means;
said first cross coupling means, when enabled, for coupling the output of said first inverter to said second node via a low impedance path which includes first transistor means conducting in the common source mode under all signal conditions, and said second cross coupling means, when enabled, for coupling the output of said second inverter to said first node via a low impedance path which includes second transistor means conducting in the common source mode under all signal conditions,.

4,107,557

SULFUR-FUELED MAGNETOHYDRODYNAMIC POWER GENERATION

Thomas L. Shepherd, Essex Fells, N.J., assignor to Airco, Inc., Montvale, N.J.

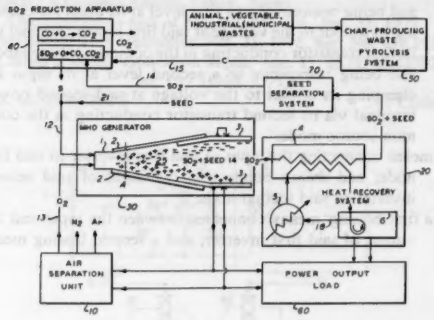
Filed Apr. 4, 1977, Ser. No. 784,001

Int. Cl.[2] H02N *4/02*

U.S. Cl. 310—11 **20 Claims**

1. A magnetohydrodynamic power generation system comprising:
a combustion chamber;
means for supplying elemental sulfur and oxygen to said combustion chamber wherein said sulfur is burned in said oxygen, forming sulfur dioxide, to generate a flame temperature of at least 8000° F and to produce a stream of positive ions and electrons;

means for separating said positive ions from said electrons; and



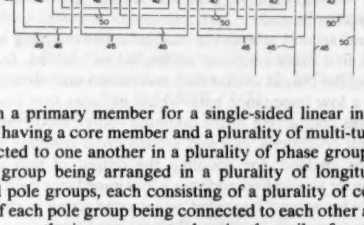
electrode means for separately collecting said positive ions and said electrons, thereby developing an electromotive force across said electrode means.

4,107,558

LINEAR INDUCTION MOTOR ASSEMBLY

Geoffrey Edward Brown, Thornhill, Canada, assignor to Spar Aerospace Products Ltd., Toronto, Canada

Filed Apr. 28, 1977, Ser. No. 791,787
Claims priority, application Canada, Apr. 30, 1976, 251532
Int. Cl.[2] H02K *41/02*
U.S. Cl. 310—13 **6 Claims**



1. In a primary member for a single-sided linear induction motor having a core member and a plurality of multi-turn coils connected to one another in a plurality of phase groups, each phase group being arranged in a plurality of longitudinally spaced pole groups, each consisting of a plurality of coils, the coils of each pole group being connected to each other at a side of the core, the improvement wherein; the coils of each phase group are connected to one another at connection points arranged on the same side of the core, the connection points of one pole group being disposed at the opposite side of the core to that at which the connection points of at least one adjacent pole group are located.

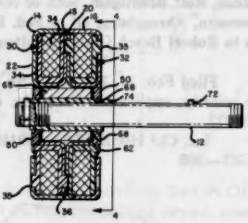
4,107,559

MINIATURE MOTOR

Jayant K. Patel, Englewood, Ohio, assignor to TRW Inc., Cleveland, Ohio

Filed Nov. 15, 1976, Ser. No. 741,545
Int. Cl.[2] H02K *37/00*
U.S. Cl. 310—49 R **3 Claims**

1. A miniature two-phase stepping motor comprising a pair of inner pole pieces having radial portions positioned in generally back-to-back relation and each having an annular array of axially extending outwardly turned poles, a first outer pole piece having a radial portion forming one end wall of the motor and having an annular array of inwardly turned axial poles spaced between the corresponding poles of one of said inner pole pieces, a second outer pole piece having a radial portion forming an opposite wall of said motor and having an annular array of inwardly turned axial poles spaced between the poles of the other of said inner pole pieces, a first plastic bobbin coil form received between said one inner pole piece and said first pole piece forming a first stepping motor phase, a second plastic bobbin coil form positioned between said second pole piece and said other inner pole piece defining a second stepping motor phase, integral axially extending protuberances



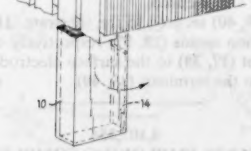
on said coil forms, means in said pole pieces defining apertures receiving said protuberances therein for interlocking said pole pieces in fixed angular relation with respect to said coil forms, axially spaced bearing means directly supported on a different one of said bobbin coil forms adjacent said outer walls, a shaft rotatably received in said bearing means, and an armature mounted on said shaft in magnetic coupled relation to said poles.

4,107,560

ELECTRIC MACHINE

Stig Lennart Hallerbäck, Vastra Frolunda, Sweden, assignor to SKF Industrial Trading and Development Company B.V., Lutphass, Netherlands

Filed Nov. 6, 1975, Ser. No. 629,380
Int. Cl.[2] H02K *9/16*
U.S. Cl. 310—60 R **9 Claims**



1. Electric machine comprising a stator and a rotor mounted in a rotor cavity in the stator, said stator including a plurality of axially extending laminations having a radially directed, circumferentially spaced end portions, the outer terminal edges of said end portions lying on the circumference of a common circle defining the rotor cavity, and means defining an axially directed cooling channel in at least one of the spaces between said lamination end portions in close proximity to the rotor cavity said means comprising longitudinal pipes having cavities for air streams said pipes protruding beyond the axial ends of the laminations, the pipe ends at one side of the stator having

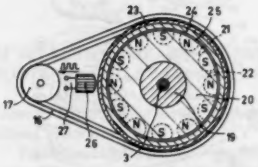
apertures facing inwards towards the rotor cavity and at the other side having apertures facing outwards from the rotor cavity.

4,107,561

CLUTCH APPARATUS FOR GENERATING A PULSE TRAIN

Peter Schmidt, Vienna, Austria, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 619,846, Oct. 6, 1975, abandoned. This application Apr. 14, 1977, Ser. No. 787,611
Claims priority, application Austria, Oct. 9, 1974, 8124/74
Int. Cl.[2] H02K *49/04*
U.S. Cl. 310—95 **2 Claims**



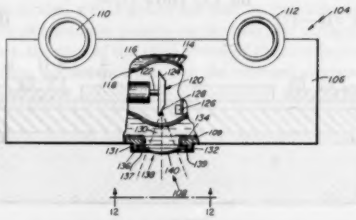
1. Apparatus for generating a pulse train depending on the speed of rotation of a rotary system, a rotary part of said system comprising magnet poles which produce an external field, which field is sensed by a stationary sensing means responding to magnetic fields and supplying the pulse train, wherein said rotary system comprises a magnetic slipping clutch having a rotary magnet portion and a magnetically coupled portion, said portions being adapted to transmit a constant torque while undergoing relative slip, said magnet poles being formed by the rotary magnet portion of the clutch, whereby said pulse train measures varying speeds corresponding to varying degrees of slip.

4,107,562

X-RAY BEAM GENERATOR

Thomas J. Koller, Huntington, and Jacob A. Randmer, Wilton, both of Conn., assignors to The Machlett Laboratories, Inc., Stamford, Conn.

Filed Aug. 30, 1976, Ser. No. 719,026
Int. Cl.[2] H01J *35/18*
U.S. Cl. 313—59 **6 Claims**



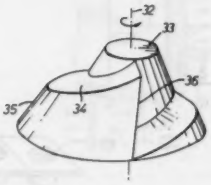
1. An X-ray beam generator comprising:
an X-ray tube including a tubular envelope having therein a focal spot area on a target surface disposed to direct a divergent X-ray beam out of the envelope; and
an X-ray shielded housing disposed to enclose the X-ray tube and including X-ray transmissive means disposed substantially concentric with respect to the center of the focal spot area for permitting egress of at least a portion of the beam having a desired configuration.

4,107,563

X-RAY GENERATING TUBES

Leonard George Oddell, Bognor Regis, England, assignor to EMI Limited, Hayes, England

Filed Apr. 6, 1977, Ser. No. 785,205
Claims priority, application United Kingdom, Apr. 28, 1976, 17203/76
Int. Cl.[2] H01J *35/10*
U.S. Cl. 313—60 **6 Claims**



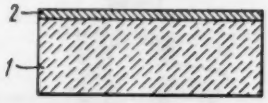
1. An x-ray generating tube having an envelope and including an anode rotatable about an axis, an electron beam source for projecting an electron beam towards said anode so as to impinge thereon at a location within the tube and produce x-radiation originating at said location, and means for reciprocating the location of the origin of the x-radiation, on the anode, relative to the envelope and in a direction substantially parallel to said axis.

4,107,564

PHOTOEMITTER

Alexandr Ivanovich Klimin, Gradhdansky prospekt, 110, korpus 1, kv. 71; Alexandr Alexeevich Mostovsky, Svetlanovsky prospekt, 35, kv. 19, and Rafail Lvovich Nemchenok, Bolshaya Pushkarskaya ulitsa 44, kv. 27, all of Leningrad, U.S.S.R.

Filed May 20, 1975, Ser. No. 579,227
Claims priority, application U.S.S.R., May 21, 1974, 2025744
Int. Cl.[2] H01J *39/00, 39/06*
U.S. Cl. 313—94 **4 Claims**

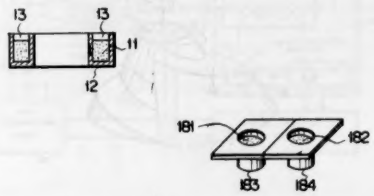


1. A photoemitter sensitive in the optical wavelength range of the light spectrum, comprising:
a. a substrate which emits electrons under the influence of said light radiation;
said substrate is made of p-type semiconductor materials belonging to a group of chemical compounds $A^{II}B^{IV}C_2^{V}$ in the periodic table, where A^{II} are chemical compounds selected from the second subgroup of group II and consisting of Zn and Cd, B^{IV} are elements selected from the second subgroup of group IV and comprising Ge, Si, Sn, and C^{V} are elements selected from the second subgroup of group V and comprising P and As;
b. one surface of said substrate;
c. a coating applied to said one surface of said base intended to reduce the electron work function and activating said surface of said substrate to the effective negative electron affinity state.

4,107,565
MERCURY EMITTING STRUCTURE

Tsuyoshi Isojima, Yokohama; Kenji Enokida, Yokosuka; Hideharu Nihei, Yokohama, and Wataru Ichise, Tokyo, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Mar. 31, 1976, Ser. No. 672,324
Claims priority, application Japan, Apr. 2, 1975, 50-39246
Int. Cl.[2] H01J 7/10, 7/18, 7/20
U.S. Cl. 313—174 11 Claims

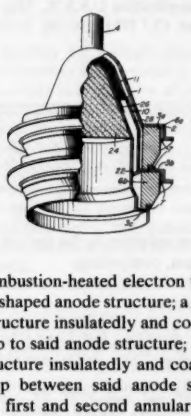


1. A mercury emitting structure comprising an alloy of an intermetallic compound having a face centered cubic lattice type crystal structure of the Al type, said alloy being yttrium, nickel and mercury, and a holder for holding said alloy.

4,107,566
RUGGED QUICK-HEATING ELECTRON TUBES

Charles P. Marsden, Jr., Washington, D.C., assignor to The United States of America as represented by the Secretaru of the Army, Washington, D.C.

Filed Feb. 7, 1955, Ser. No. 486,743
Int. Cl.[2] H01J 1/46, 21/10
U.S. Cl. 313—293 5 Claims

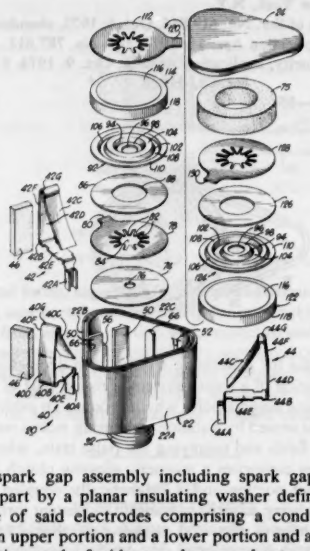


1. A rugged combustion-heated electron tube comprising: a metallic conically-shaped anode structure; a metallic conically-shaped cathode structure insulatedly and coaxially mounted in spaced relationship to said anode structure; a metallic conically-shaped grid structure insulatedly and coaxially mounted in spaced relationship between said anode structure and said cathode structure; first and second annular insulating spacer-seals separating said anode structure from said grid structure and said grid structure from said cathode structure, said spacer-seals in combination with said anode structure and said cathode structure providing a hermetically-sealed envelope containing said grid structure; and a combustible material mounted exteriorly of said envelope in proximity to said cathode structure, said combustible material being adapted to heat said cathode structure to an operating temperature.

4,107,567
SURGE PROTECTOR

Francis V. Cunningham, Western Springs, and Michael A. Fanizza, Mount Prospect, both of Ill., assignors to Joslyn Mfg. and Supply Co., Chicago, Ill.

Division of Ser. No. 472,355, May 22, 1974, Pat. No. 3,987,343.
This application Oct. 14, 1976, Ser. No. 732,487
Int. Cl.[2] H01J 17/00, 21/00
U.S. Cl. 313—325 9 Claims

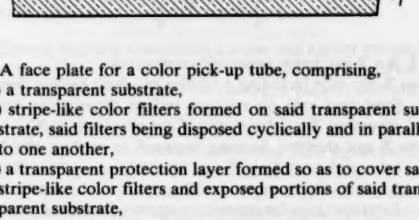


1. A spark gap assembly including spark gap electrodes spaced apart by a planar insulating washer defining a spark gap, one of said electrodes comprising a conductive plate having an upper portion and a lower portion and an outermost edge portion, each of said upper, lower and outermost portions having a common center, said outermost edge portion being substantially spaced from both said upper and lower portions and disposed between said upper and lower portions.

4,107,568
FACE PLATE FOR COLOR PICK-UP TUBE

Toshio Nakano, Hachioji; Akira Sasano, Kodaira; Ken Tsutsui, Tachikawa, and Haruo Matumaru, Tokyo, all of Japan, assignors to Hitachi, Ltd. and Hitachi Electronics Ltd., both of, Japan

Filed Nov. 15, 1974, Ser. No. 524,274
Claims priority, application Japan, Dec. 3, 1973, 48-134306; Aug. 2, 1974, 49-88049
Int. Cl.[2] H01J 31/46
U.S. Cl. 313—371 10 Claims



1. A face plate for a color pick-up tube, comprising,
(a) a transparent substrate,
(b) stripe-like color filters formed on said transparent substrate, said filters being disposed cyclically and in parallel to one another,
(c) a transparent protection layer formed so as to cover said stripe-like color filters and exposed portions of said transparent substrate,
(d) stripe-like transparent electrodes deposited over said

stripe-like color filter through said protection layer interposed therebetween, and

(e) bus bar electrodes electrically connected to said transparent electrodes in such a manner that each bus bar electrode is connected with corresponding transparent electrodes but insulated from the remaining transparent electrodes by an interposed insulation layer,

further comprising a flattening layer for correcting unevenness of surface, which layer is disposed between said protection layer and said stripe-like color filters and said transparent substrate.

4,107,569

COLOR SELECTION MEANS COMPRISING LENS ELECTRODES SPACED BY GRAINS OF INSULATING MATERIAL

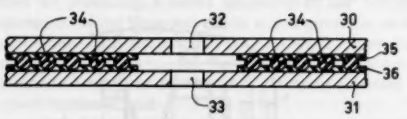
Hubertus Joseph Ronde, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 13, 1977, Ser. No. 759,089

Claims priority, application Netherlands, Jan. 16, 1976, 7600420

Int. Cl.² H01J *29/07, 19/30*

U.S. Cl. 313—402 **3 Claims**



1. A colour display tube comprising in an evacuated envelope means to generate a number of electron beams, a display screen comprising a large number of regions luminescing in different colours, and colour selection means having a large number of apertures which associate each electron beam with luminescent regions of one colour, which colour selection means comprise a first and a second system of lens electrodes, a lens electrode belonging to the first system being kept at a defined distance from a lens electrode belonging to the second system, characterized in that a lens electrode belonging to the first system is kept at a defined distance from a lens electrode belonging to the second system by means of grains of an electrically insulating material present between the facing surfaces of the electrodes, which grains are sunk on two sides in layers of an adhesive material present on the two said surfaces of the electrodes, the sum of the thicknesses of the said layers being smaller than the distance between the relevant electrodes.

4,107,570

CATHODE RAY TUBE INDEXING STRUCTURES

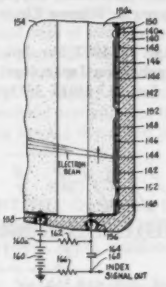
Clayton A. Washburn, 24 Andrea La., Thornwood, N.Y. 10594

Division of Ser. No. 340,167, Mar. 12, 1973, Pat. No. 3,914,651. This application Jun. 11, 1975, Ser. No. 585,922

Int. Cl.² H01J *29/10, 29/32*

U.S. Cl. 313—471 **22 Claims**

1. A screen for a cathode ray tube, comprising a supporting surface, a mosaic of elements positioned on said surface, selected ones of said elements being free of phosphoros and comprising indexing elements atoms of which have high atomic weight, said indexing elements being positioned in predetermined areas of said surface, and a backing film against



said mosaic and of a material having an atomic weight less than the atomic weight of said indexing elements.

4,107,571

LIGHT EMITTING DEVICE HAVING LUMINESCENT SCREEN WITH SELF ACTIVATED BLUE LIGHT EMITTING PHOSPHOR

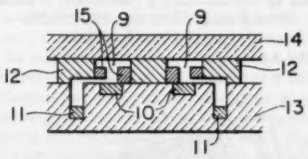
Shinkichi Tanimizu, Kokubunji; Teruki Suzuki, Funabashi, and Tadashi Fukuzawa, Tokyo, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 22, 1974, Ser. No. 516,953

Claims priority, application Japan, Oct. 22, 1973, 48-117966; Oct. 22, 1973, 48-117967

Int. Cl.² H01J *61/16, 61/44*

U.S. Cl. 313—486 **17 Claims**



1. A light emitting device comprising:

a light-permeable envelope,

an exciting source providing excitation energy ranging from 5 to 25 eV, said exciting source being a gas selected from the group consisting of xenon, krypton, argon, neon, helium, or a mixture thereof, and

a luminescent screen which is provided inside said envelope at which it can convert said excitation energy from said exciting source into visible light, said luminescent screen containing a phosphor represented by the general formula:

$$M_{1-a}Eu_aP_bV_{1-b}O_4$$

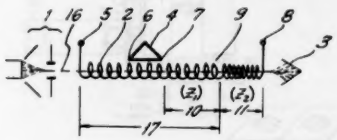
where M stands for at least one member selected from the group consisting of yttrium, scandium, rare-earth elements having atomic numbers of 57 - 62 and 64 - 71, and group-IIIb elements of the periodic table, wherein said phosphor is a self-activated blue light emitting phosphor where $a = 0$ and $0 < b < 1.0$.

4,107,572

TRAVELING-WAVE TUBE HAVING PHASE VELOCITY TAPERING MEANS IN A SLOW-WAVE CIRCUIT

Yoshio Yuasa; Yosihiro Morizumi, and Ryuzo Orui, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Apr. 14, 1977, Ser. No. 787,359
Claims priority, application Japan, Apr. 16, 1976, 51-43195
Int. Cl.[2] H01J *25/34*
U.S. Cl. 315—3.6 5 Claims



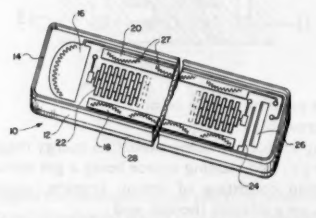
1. A traveling-wave tune including an electron gun for providing a beam of electrons, a collector for collecting said electrons, a slow-wave circuit disposed midway between said electron gun and said collector for effecting interaction between the electron beam and an electromagnetic wave, and an attenuator provided along the slow-wave circuit; said slow-wave circuit having a constant phase velocity section disposed on the electron gun side of said slow-wave circuit for imparting a constant phase velocity to the electromagnetic wave propagating therethrough, and a phase velocity tapering section disposed on the collector side of said slow-wave circuit for imparting a smaller phase velocity than said constant phase velocity to said electromagnetic wave; the ratio of the length of said phase velocity tapering section to the length from the collector side end of said attenuator to the electron gun side end of said phase velocity tapering section being equal to or less than 0.4.

4,107,573

PRINTED CIRCUIT TRAVELING WAVE TUBE

Bobby R. Potter, Richardson, Tex., and Allan W. Scott, Los Altos, Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 2, 1977, Ser. No. 773,563
Int. Cl.[2] H01J *25/34*
U.S. Cl. 315—3.5 6 Claims



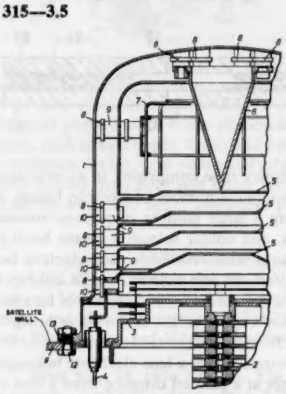
1. A microwave traveling wave tube comprising:
a pair of flat dielectric members defining a vacuum enclosure therebetween,
means at one end of said enclosure for emitting an electron beam,
means at the other end of said enclosure for collecting said electron beam,
means for focusing said electron beam into a flat sheet beam between said emitting and collecting means, and
microwave interaction circuit means disposed on at least one of said dielectric members and extending along said electron beam for applying microwave energy of a given frequency range to interact with said electron beam, said interaction circuit means including a planar multiple circuit strip meanderline disposed on the inner surface of said one dielectric member adjacent said electron beam and a ground plane conductor strip disposed on the opposite surface of said dielectric member, and oscillation suppression means disposed along said ground plane conductor strip for attenuating oscillations of selective microwave frequencies.

4,107,574

TRAVELLING-WAVE TUBE WITH COLLECTOR HOUSING HAVING ALL ELECTRICAL CONNECTIONS THROUGH ONE END WALL OF HOUSING

Herbert Ruf, Temmenhausen; Dieter Deml, Ay-Senden, and Werner Schwarz, Erbach, all of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Jun. 9, 1976, Ser. No. 694,222
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1975, 2526681
Int. Cl.[2] H01J *25/34*
U.S. Cl. 315—3.5 16 Claims

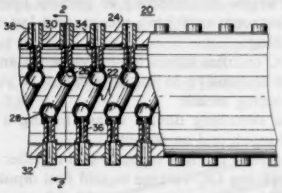


1. In a travelling-wave tube having a delay line section and an electron collector comprising several electrodes arranged inside a hollow cylindrical metal cooling chamber, one end wall of which is annular, is connected to the end of said delay line section so as to be vacuum-tight and has a diameter which is greater than the diameter of said delay line section; the improvement wherein: a plurality of electrical insulators which are good conductors of heat are fastened to the inner surface of the wall of said cooling chamber, said individual collector electrodes are mounted on said insulators so as to be good conductors of heat to, while being electrically insulated from, said cooling chamber, insulated bushings are provided on a portion of the annular surface of said one end wall which extends laterally beyond said delay line section, said bushings being connected to said individual collector electrodes in an electrically conductive manner, and means on said end wall connected to said delay line section for fastening said travelling-wave tube to a support wall so that said cooling chamber is located substantially on one side of said support wall and said delay line section and said insulated bushings extend through one or several openings in said support wall.

4,107,575
FREQUENCY-SELECTIVE LOSS TECHNIQUE FOR OSCILLATION PREVENTION IN TRAVELING-WAVE TUBES

Norman R. Vanderplaats, Alexandria, Va., and Henry D. Arnett, Washington, D.C., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 4, 1976, Ser. No. 729,550
Int. Cl.[2] H01J *25/34*
U.S. Cl. 315—3.5 **18 Claims**



1. In a traveling-wave tube of the type wherein a beam of electrons flows along the axis of a slow-wave interaction circuit through which an electromagnetic wave propagates, said slow-wave interaction circuit being axially disposed within a conductive metal shell, the improvement comprising means for preventing backward-wave oscillations, said preventing means comprising:

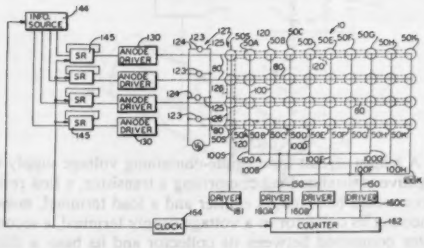
means for producing a cutoff frequency of the −1 space harmonic of the slow-wave interaction circuit at or near zero-phase-shift per period of the slow wave circuit and at or near the frequency of the potential backward-wave interaction between said beam of electrons and said −1 space harmonic; and

lossy material disposed between said slow-wave interaction circuit and said conductive shell, said lossy material being disposed so as to couple strongly with the electromagnetic field of said −1 space harmonic in the vicinity of said cutoff frequency.

4,107,576
PANEL-TYPE DISPLAY DEVICE

James A. Ogle, Neshanic Station, and George E. Holz, North Plainfield, both of N.J., assignors to Burroughs Corporation, Detroit, Mich.

Division of Ser. No. 624,532, Oct. 22, 1975, Pat. No. 4,035,689, which is a division of Ser. No. 487,955, Jul. 12, 1974, Pat. No. 3,989,981, which is a continuation of Ser. No. 255,133, May 19, 1972, abandoned, which is a continuation of Ser. No. 850,984, Aug. 18, 1969, abandoned, which is a continuation-in-part of Ser. No. 828,792, May 28, 1969, abandoned. This application Dec. 2, 1976, Ser. No. 746,875
Int. Cl.[2] H05B *37/00*
U.S. Cl. 315—169 TV **16 Claims**



1. A gas discharge display device including

a gas-filled envelope,

at least one series of display positions disposed along a line in said envelope,

auxiliary particle-supply cells at opposite ends of said line,

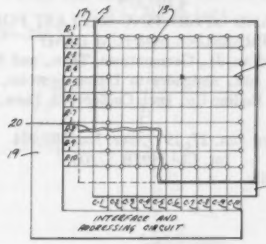
means for initiating a glow discharge substantially simultaneously in selected ones of said auxiliary cells, to facilitate the generation of glow discharges in the adjacent display cells along said line and in the adjacent auxiliary cells, and

means for scanning the display cells starting with the two display cells which are next adjacent the selected auxiliary cells and moving toward the center of the line.

4,107,577
TRANSFER WITHIN GASEOUS DISCHARGE DISPLAY/MEMORY DEVICE

James F. Nolan, Sylvania, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 445,921, Feb. 26, 1974, abandoned, which is a continuation of Ser. No. 103,848, Jan. 4, 1971, Pat. No. 3,803,448. This application Oct. 4, 1976, Ser. No. 729,447
The portion of the term of this patent subsequent to Apr. 9, 1991, has been disclaimed.
Int. Cl.[2] H05B *41/14*
U.S. Cl. 315—169 TV **1 Claim**



1. In a process for operating a multiple gaseous discharge display/memory panel device comprising a multiplicity of alternating current operated gaseous discharge units, including discharge units at one side of said panel,

the improvement wherein each discharge unit is in physically unconstrained open photonic communication with all of its adjacent discharge units and at least one discharge unit at the side of said panel has a discharge entered thereto and wherein said discharge at said at least one discharge unit at the side of the panel is electronically transferred and propagated laterally from one discharge unit to a first neighboring adjacent unit and from said first neighboring adjacent unit to one of its neighboring adjacent units remote from said at least one discharge unit at the side of said panel and so on across said panel to a selected discharge unit and terminating the transfer of said discharge at said selected unit.

4,107,578
GAS DISCHARGE PANEL DRIVE SYSTEM

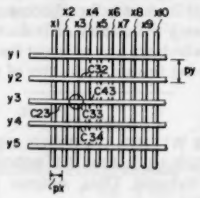
Toyoshi Kawada; Shizuo Andoh, and Kazuo Yoshikawa, all of Kobe, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Apr. 22, 1977, Ser. No. 790,094
Claims priority, application Japan, May 10, 1976, 51/53589
Int. Cl.[2] H05B *37/00, 39/00, 41/00*
U.S. Cl. 315—169 TV **10 Claims**

1. A drive system for driving a gas discharge panel, said panel comprising a plurality of X electrodes respectively covered with dielectric layers and forming an X-electrode group, and a plurality of Y electrodes respectively covered with dielectric layers and forming a Y-electrode group, which are disposed opposite to each other across a space having sealed therein a discharge gas, wherein a given one of the X electrode

group and the Y electrode group has a pitch which is smaller than the pitch of the other electrode group; said drive system comprising:

first means for applying a positive pulse voltage to a selected one of the electrodes of said given one of said X and Y electrode groups; and



second means for applying a negative pulse voltage to a selected one of the electrodes of the other one of the X and Y electrode groups;

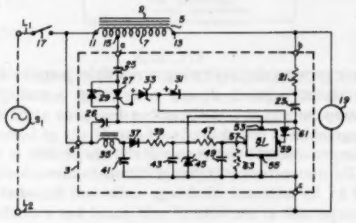
whereby to impose a write pulse on a corresponding selected discharge point of said gas discharge panel.

4,107,579

STARTING AND OPERATING BALLAST FOR HIGH PRESSURE SODIUM LAMP

Richard Hill Bodine, Jr., Germantown, Tenn., and Marion Rosiak, Athens, Ala., assignors to Litton Systems, Inc., Bellwood, Ill. and Bodine Co., Inc., Collierville, Tenn., part interest to each

Filed Jun. 27, 1977, Ser. No. 809,994
Int. Cl.[2] H05B *37/00*
U.S. Cl. 315—205 **17 Claims**



1. In a starting and operating apparatus for starting and operating a high intensity gaseous discharge lamp from a source of sinusoidal AC voltage having a predetermined cycle, which apparatus contains at least one inductive winding means of electrical insulated wire located on a core of magnetic material and circuit means operatively connecting said winding in circuit with said lamp for supplying AC operating voltage thereto; said lamp requiring a high starting voltage, higher than the voltage of said AC source, and at least ten times greater than its operating voltage; first capacitor means; first semiconductor controlled rectifier type electronic switching means, having alternate current conducting and nonconducting states and a gate input terminal, responsive to a predetermined voltage at said gate for switching into the conductive state; voltage breakdown switch device means connected in series with said gate input terminal, said breakdown device requiring a predetermined level of voltage thereacross to switch into an electrically conductive state to provide a predetermined voltage to said gate input; said first capacitor means and said first electronic switching means being coupled in circuit with at least a portion of said winding means to provide a discharge current path for any electrical charge in said first capacitor that extends through said winding portion responsive to said first electronic switching means being in the current conducting condition, whereby a high voltage pulse may be generated across said winding means through transformer action of a level exceeding the lamp starting voltage, and trigger circuit means for providing during a portion of an AC half cycle a voltage of a level sufficient to switch said voltage breakdown device at least once during each AC cycle only during the period when said AC voltage across said lamp is in excess of said lamp operating voltage; the improvement therein comprising in combination:

cut-out means for inhibiting said voltage breakdown device at a predetermined interval of time subsequent to the direct or indirect application of AC voltage from said source across said winding to prevent operation of said first electronic switching means, said last named means comprising:

AC to DC rectifier means for providing at an output a DC voltage responsive to the application of AC voltage to said winding means;

electronic switching device means having a first input, a second input, and an output;

means coupling the first input to said rectifier means output for supplying DC voltage to said first input;

said switching device means capable of providing a first or second output at the said output thereof, alternately, in the presence of DC voltage at said first input, responsive to a voltage at said second input being below or above, respectively, a predetermined voltage level;

timing network means having an input coupled to said rectifier means output and having an output coupled to said second input of said switching device means for providing at its output a voltage above said predetermined voltage level responsive to the continued presence of said DC voltage at said rectifier means output for at least a predetermined time interval, said time interval being greater than the normal starting time of a lamp, and further responsive to the absence of DC voltage at said rectifier means output for providing at its output a voltage of less than said predetermined voltage level;

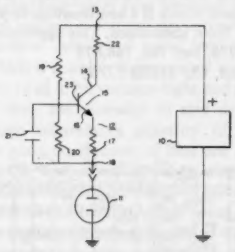
means coupling said output of said switching device means in circuit with said voltage breakdown device means for inhibiting operation of said voltage breakdown device means responsive to said switching device means providing a second output.

4,107,580

BALLAST CIRCUIT FOR GAS GLOW DISCHARGE DEVICES

Philip C. Thackray, 14 S. Drive, Valencia, Pa. 16059

Filed Feb. 24, 1977, Ser. No. 771,671
Int. Cl.[2] H05B *41/392*; G05F *1/52*
U.S. Cl. 315—311 **4 Claims**



1. A ballast circuit for a ripple-containing voltage supply to a negative resistance load comprising a transistor, a first resistor connected between its emitter and a load terminal, means connecting its collector to a voltage supply terminal, a second resistor connected between its collector and its base, a third resistor connected between its base and the said load terminal, and a decoupling capacitor connected in parallel with the third

resistor, the value of the second resistor being adjusted to exceed the negative resistance of the load and the voltage between transistor base and collector being adjusted to a value preventing the saturation of the transistor by the ripple voltage.

4,107,581

FLUORESCENT LAMP INSERT WITH CONDUCTIVE ROD SUPPORT

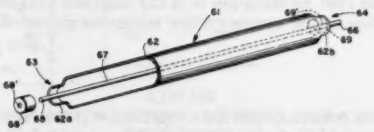
Robert R. Abernethy, 7295 Walton Rd., Walton Hills, Ohio 44116

Continuation-in-part of Ser. No. 575,628, May 8, 1975, Pat. No. 4,053,811. This application Apr. 15, 1976, Ser. No. 675,801

The portion of the term of this patent subsequent to Oct. 11, 1994, has been disclaimed.

Int. Cl.[2] H05B *41/16, 41/46;* H01G *1/02*

U.S. Cl. 315—324 **8 Claims**



4. For use in a lighting apparatus including a ballast circuit normally operable to effect energization of plural electric discharge lamps normally mounted in plural socket-type connectors of the lighting apparatus, the improvement comprising means for substantially completing said ballast circuit when one of said lamps has been removed from its respective socket-type connectors thereby to enable said ballast circuit effectively to energize at least one remaining lamp allowing normal lumen output in circuit connection therewith, said means for substantially completing said ballast circuit comprising a relatively rigid, electrically conductive rod-like means for connecting a contact in one of said respective socket-type connectors to a contact in another of said respective socket-type connectors in the lighting apparatus, a tubular body substantially coextensive with said rod-like means, and coupling means for coupling said tubular body and said rod-like means substantially as an integral structure, said coupling means comprising resilient plug-like members that fit relatively snugly in said tubular body and have respective openings through which respective ends of said rod-like means extend for connection with respective contacts of the socket-type connectors of the lighting apparatus.

4,107,582

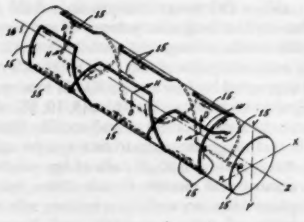
CHARACTER SELECTOR FOR A SHAPED BEAM CATHODE RAY TUBE

Charles Robert Corpew, El Cajon, Calif., assignor to Stromberg Datagraphix, Inc., San Diego, Calif.

Filed Jul. 21, 1976, Ser. No. 707,264

Int. Cl.[2] G06K *15/20;* H01J *31/16*

U.S. Cl. 315—365 **8 Claims**



1. A unitized selector for a shaped beam cathode ray tube including a neck with a central axis therethrough, positioned within said neck is an electron gun producing an electron beam directed along said central axis and a stencil having a plurality of apertures therethrough, said apertures arranged in a two dimensional pattern for shaping the cross-section of said electron beam passing through one of said plurality of apertures, comprising a pair of interacting shaped coils substantially longitudinally disposed on said neck, each of said coils comprises at least a single winding shaped to form three principal sections, and two cross-over sections for directing said electron beam on an off-axis trajectory through a selected one of said plurality of apertures, first on a path away from said central axis, then along a path convergent with said central axis, and then along a path coincident with said central axis, whereby said pair of interacting shaped coils have inherent alignment that provides a high degree of cancellation of undesirable effects.

4,107,583

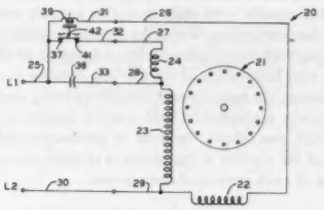
DYNAMOELECTRIC MACHINE WINDING ARRANGEMENTS, DYNAMOELECTRIC MACHINES INCORPORATING SAME AND METHODS OF OPERATING SUCH DYNAMOELECTRIC MACHINES

Jack A. Houtman, Holland, Mich., assignor to General Electric Company, Fort Wayne, Ind.

Filed Apr. 7, 1977, Ser. No. 785,512

Int. Cl.[2] H02P *1/44*

U.S. Cl. 318—221 D **17 Claims**



1. In a stator assembly for an induction motor including a magnetic core having regions for accommodating winding turns; a primary phase winding having a number of effective turns n_{le} thereof accommodated by the magnetic core; and an auxiliary phase winding having a first section having a number of effective turns n_{lesr} and particularly adapted for energization during both starting and running conditions, and having a second section particularly adapted for energization only during starting conditions, the improvement comprising: said second section having a preselected number of negative effective winding turns arranged and interconnected to be in bucking relation to said first section whereby the number of effective turns n_{lesr} reduced by said preselected number of negative effective winding turns is equal to a net number of effective turns n_{less}; the ratio of n_{less} to n_{le} is defined as a_p; the ratio of n_{lesr} to n_{le} is defined as a_r; and the number a_r is greater than the number a_p; whereby the stator assembly may be operated in a resistance start motor having satisfactory starting relay characteristics and also having satisfactory characteristics as a capacitor run motor.

4,107,584

CURRENT LIMITING DEVICE FOR AN A.C. MOTOR

Jean Roger, Conflans Ste Honorine, France, assignor to Aciers et Outillage Peugeot, Audincourt, France

Filed May 18, 1977, Ser. No. 797,960

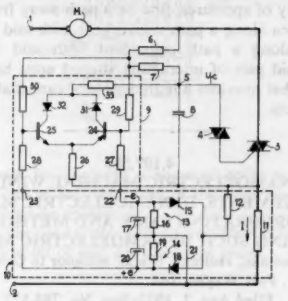
Claims priority, application France, May 18, 1976, 76 14943

Int. Cl.[2] H02P *5/40*

U.S. Cl. 318—227 **5 Claims**

1. A device for limiting the current in an a.c. motor having a commutator and for connection to a single-phase a.c. current source, the device comprising an RC phase-shifting circuit, a triggerable silicon-controlled rectifier component connected in

series with said motor and in parallel with the RC phase-shifting circuit which is for furnishing the control voltage of said rectifier component, said RC circuit having a capacitive branch, a shunt circuit which is connected in parallel with said RC circuit and shunts a certain quantity of the charging current of said branch for modifying the trigger instants of said component, said shunt circuit comprising two transistors of opposed conductivity types and each comprising a base, an emitter and a collector and connected with a common emitter



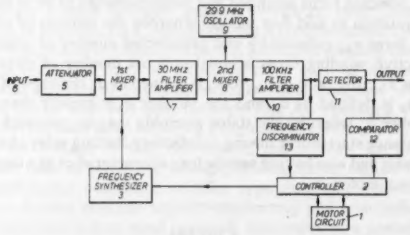
configuration, said transistors having collector-emitter circuits connected in parallel with said capacitive branch, said limiting device further comprising a control circuit furnishing two d.c. control signals whose magnitudes are a function of the intensities of the two half-cycles of the current flowing in said rectifier component, the bases of said transistors being connected to be respectively subjected to said control signals so that said shunt circuit can shunt, beyond a predetermined current threshold of the current in the motor, a notable part of the two half-cycles of each period of the current.

4,107,585

CONTROL DEVICES

Damer Evelyn O'Neill Waddington, St. Albans, England, assignor to Marconi Instruments Ltd., England

Filed Mar. 16, 1977, Ser. No. 778,312
Int. Cl.[2] H02K *27/20*
U.S. Cl. 318—331 **5 Claims**



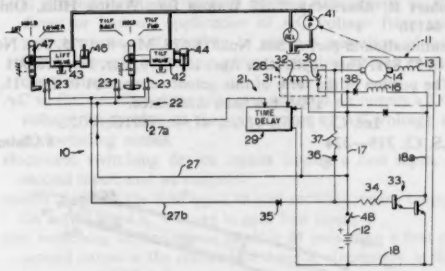
1. A control device suitable for an electronic apparatus and including means whereby rotation can be imparted to a rotational member of a d.c. ironless motor, means for driving from the back e.m.f. generated by the motor when it is turned a driving signal which is used to continue the rotation of the rotatable member to simulate an inertial effect and means coupled to the rotational member for scanning a range of signal or data values, and means for detecting a selected parameter of said range of values and which is arranged to stop rotation of said member upon detection of the selected parameter.

4,107,586

CONTROL SYSTEM FOR A COMPOUND DC ELECTRIC MOTOR

Frank S. Buchwald, Beachwood, and Grant C. Melocik, Chardon, both of Ohio, assignors to Towmotor Corporation, Mentor, Ohio

Filed Jan. 24, 1977, Ser. No. 761,929
Int. Cl.[2] H02P *1/16*
U.S. Cl. 318—426 **5 Claims**



1. A control system for connecting a power source to a compound DC electric motor which has a series field winding connected in parallel with a shunt field winding, comprising:

time delay means for energizing said series field winding only after said shunt field winding has been energized for a predetermined period of time, said time delay means including an electrical switching device and a time delay device, said electrical switching device being positioned between the series field winding and the power source, said time delay device being connected to the electrical switching device and being of a type activated by an electrical signal thereto for completing an electrical circuit to actuate the electrical switching device after being activated for said predetermined period of time;

an electronic switching device positioned between the power source and the shunt field winding, said electronic switching device being of the type rendered conductive by an electrical signal thereto; and

a switch positioned between the power source and both the time delay device and the electronic switching device for delivering said electrical signal simultaneously to the time delay device and the electronic switching device.

4,107,587

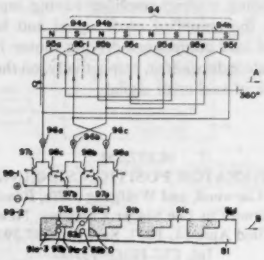
THREE-PHASE DC MOTOR HAVING NON-SUPERIMPOSED ARMATURE COILS

Itsuki Ban, 829, Higashioizumi-machi, Nerima-ky, Tokyo, and Manabu Shiraki, 171 Shimotsuruma, Yamato-shi, Kanagawaken, both of Japan

Filed Sep. 17, 1975, Ser. No. 614,318
Claims priority, application Japan, Sep. 24, 1974, 49-108866; Sep. 24, 1974, 49-108865; Jul. 31, 1975, 50-92553; May 12, 1975, 50-44725; Mar. 6, 1975, 50-26508
Int. Cl.[2] H02K *13/14*
U.S. Cl. 318—439 **10 Claims**

1. In a coreless DC motor comprising a fixed field magnet (27, 121) having four magnetic poles of N and S magnetized in equal angular widths; a magnetic material (2, 3, 12, 16, 70, 75-1) for closing magnetic paths of said field magnet; a rotating shaft (1, 15, 73) supported by bearings provided to a central portion of said magnetic material; an armature (5, 10, 57) of one of disc and cylindrical-shapes secured to said rotating shaft so as to be rotatable in said magnetic paths to face against said field magnet poles; three-phase armature coils of lap winding arranged on said armature; and electric circuit means interconnecting said three-phase armature coils in a manner selected from the class consisting of delta-connection and Y-connection for supplying current to said coils, the improvement wherein: said three-phase armature coils comprise three windings (21, 22, 23,

122*a–c*) each arranged at equal angular interval so as to be non-superimposed with respect to one another on the armature



by shifting the coil (23*a*, 122-1) of one-phase by 180°; each of said coils having an angular width equal to that of said field magnet pole.

4,107,588

MULTIPLE TIMING INTERVAL INTEGRATED CIRCUIT STRUCTURE

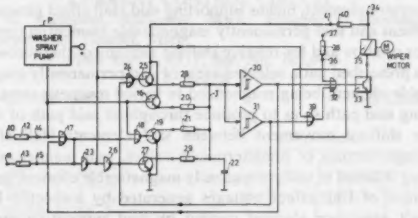
Hartmut Seiler, Reutlingen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Mar. 10, 1977, Ser. No. 776,422

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1976, 2618028

Int. Cl.² H02H *7/085*

U.S. Cl. 318—484 **12 Claims**



1. Multiple timing interval integrated timing circuit structure comprising

a plurality of input terminas (10, 11) of which, selectively, a signal applied to a first terminal (10) has priority over a signal applied to another terminal (11);

a main timing capacitor (22), the charge and discharge time of the timing capacitor determining the timing intervals;

at least two charge resistors (20, 28);

at least two discharge resistors (21, 29) each associated with a respective charge resistor;

at least two selectively controllable charge switches (16, 25), each, respectively, connected to a respective charge resistor (20, 28) and to said timing capacitor (22);

at least two selectively controllable discharge switches (19, 27) each connected to a respective associated discharge resistor (21, 29) and to the timing capacitor (22);

a charge resistor (20, 28), a controlled charge switch (16, 25), a discharge resistor (21, 29) and a controlled discharge switch (19, 27), together with the timing capacitor (22) forming a charge/discharge system;

at least two comparators (30, 31), said comparators having respectively different threshold levels, each associated with a charge/discharge system and connected to the timing capacitor (22), the comparators determining the charge voltage across the timing capacitor (22) and providing respective output signals when the voltage across the timing capacitor changes with respect to upper and lower threshold levels of said comparators;

the output of at least one comparator (30) being connected with the control input of that one discharge switch (19) which is associated with the discharge resistor (21) of the charge/discharge system connected to the terminal (10) having assigned the highest priority;

an interlock logic circuit (17) disabling that one of said charge/discharge systems connected to the terminal (11) having subordinate priority,

and wherein the charge/discharge system (16, 20, 19, 21, 22) connected to the higher priority terminal (10) has the output of the associated comparator (30) thereof connected to the interlock logic circuit (17) so that the system (25, 28, 27, 29; 22) having subordinate priority will be blocked during the charge and discharge phases of the system having dominance, or priority.

4,107,589

AUTOMATIC TOOL CHANGE APPARATUS

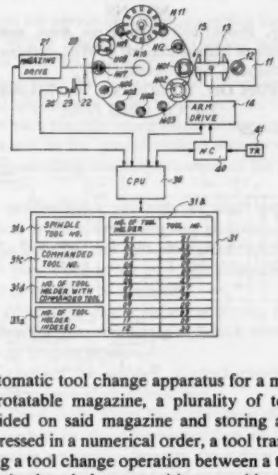
Kunihiko Eto, Toyota; Kuniyuki Niwa, Kariya, and Kaoru Owa, Nukata, all of Japan, assignors to Toyoda-Koki Kabushiki-Kaisha, Japan

Filed Jul. 19, 1977, Ser. No. 817,023

Claims priority, application Japan, Jul. 28, 1976, 51-90666

Int. Cl.² G05B *19/28*

U.S. Cl. 318—602 **5 Claims**



1. In an automatic tool change apparatus for a machine tool including a rotatable magazine, a plurality of tool holding devices provided on said magazine and storing a variety of tools and addressed in a numerical order, a tool transfer device for performing a tool change operation between a tool indexed at a predetermined tool change position on said magazine and a tool held in a spindle of said machine tool, means for rotating said rotatable magazine, means for generating an index signal each time each tool holding device is indexed to the tool change position, means for commanding a tool to be indexed to the tool change position, first memory means for storing a number of a tool held in the spindle, second memory means for storing a relationship between numbers of the tool holding devices and numbers of the tools held in the respective tool holding devices, third memory means responsive to said command means for storing a number of the commanded tool, fourth memory means responsive to said index signal generating means for storing a number of a tool holding device indexed at the tool change position, means responsive to said command means for searching for a number of a tool holding device holding the commanded tool from said second memory means, fifth memory means responsive to said searching means for storing the searched number of the tool holding device, means for determining a rotational direction of said magazine in accordance with a difference in the contents stored in said fourth and fifth memory means to thereby cause said rotating

means to rotate said magazine and for checking coincidence of the contents in said fourth and fifth memory means, means for loading the content of said third memory means into said first memory means and for loading the content of said first memory means into said second memory means after the tool change operation has been completed by said tool transfer device, the improvement of which comprises:

the numbers of the tools being identifiable whether the tools are large or small ones;

first discrimination means for discriminating whether the tool held in said spindle and the commanded tool are large or small ones in accordance with the contents stored in said first and third memory means;

second discrimination means responsive to said first discrimination means for discriminating a combination of the tool held in said spindle and the commanded tool so as to determine whether the tool held in the spindle can be immediately returned to the tool holding device holding the commanded tool; and

cycle control means responsive to said second discriminating means for causing a normal cycle of a tool change operation to be performed if the spindle tool has been found to be immediately returnable, and for causing a special cycle of a tool change operation to be performed if the spindle tool has been found not to be immediately returnable.

4,107,590

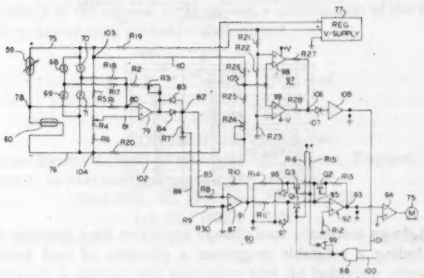
POWER ASSIST DEVICE USING STRAIN RESPONSIVE MEANS

Thomas Pury, Brookfield; Menachem Assa, and Howard R. Wagner, both of Milwaukee, all of Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 18, 1976, Ser. No. 733,644

Int. Cl.[2] G05B *11/01*

U.S. Cl. 318—628 **15 Claims**



1. For use with x-ray apparatus having a moveable component which is subject to being selctively positioned and having motor means operatively coupled to said component for driving it to desired positions; control means comprising:

manually engageable handle means coupled to said component and subject to having a manual force applied substantially in the direction in which movement of said component is desired,

strain responsive means having input and output means,

means for imparting a strain to said strain responsive means in correspondence with the force applied to said handle means,

said strain responsive means having the property of varying its electric resistance in response to varying the strain imparted thereto,

voltage source means for providing a voltage to said input means to produce a predetermined output signal at said output means in the absence of a force and to produce an error signal having a magnitude and polarity depending on the magnitude and direction, respectively, of the force applied to said handle,

non-integrating linear amplifier means having input means for receiving said error signal and having output means, said amplifier means being operative to produce an output signal that is directly proportional in magnitude and polarity to said error signal, and

means including a servo-amplifier having input means for receiving the amplified error signal and having output means for said component driving motor in a direction and at a rate independent, respectively, on the polarity and magnitude of said error signal.

4,107,591

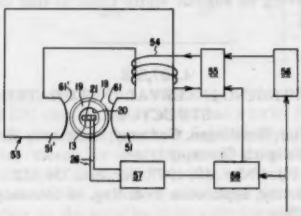
HALL GENERATOR POSITION SENSING DEVICE

John A. Herr, Garwood, and Wolfgang Jaffe, Roselle Park, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed Apr. 14, 1977, Ser. No. 787,391

Int. Cl.[2] H01F *13/00*

U.S. Cl. 318—663 **4 Claims**



1. A brushless position sensing device comprising an element formed of permanently magnetizable material, a Hall effect generator element, means supporting said Hall effect generator element and said permanently magnetizable element in contiguous relation and for relative shifting movement therebetween in a prescribed path, selected areas of said permanently magnetizable element being magnetized in varied magnetic intensity along said path so as to produce throughout said path of relative shifting movement between said elements Hall effect voltage outputs of predetermined values, said magnetization being induced in said permanently magnetizable element under control of Hall effect voltages generated by a specific Hall effect generator element carried by said supporting means contiguous to a specific permanently magnetizable element during inducement of said magnetization.

4,107,592

AUTOMATICALLY OPERATING SPEED-REGULATED POSITIONING ARRANGEMENT

Friedrich Bayer, Stockstadt, Fed. Rep. of Germany, assignor to Quick-Rotan Becker & Notz KG, Darmstadt, Fed. Rep. of Germany

Filed May 17, 1974, Ser. No. 471,034

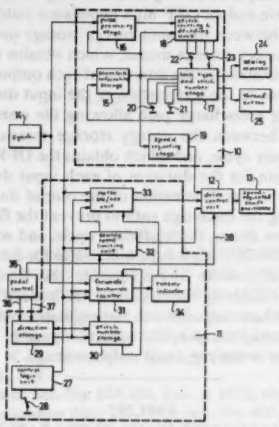
Claims priority, application Fed. Rep. of Germany, May 22, 1973, 2325969

Int. Cl.[2] G05B *19/10*

U.S. Cl. 318—568 **4 Claims**

1. In combination with a sewing machine having a drive means, a control arrangement for the sewing machine, comprising, in combination, lock-type selector means having a plurality of manually selectable settings selectable by the user of the sewing machine for selecting different types of seam-end locks; stitch-number selector means having a plurality of manually selectable settings selectable by the user of the sewing machine for selecting numbers of stitches in seam-end locks; and drive control means connected to said drive means and to said selector means and activatable by the user of the sewing machine for causing the sewing machine to automatically sew a seam having a predetermined number of stitches including at

at least one of the two ends of the seam a seam-end lock of the type corresponding to the setting of said lock-type selector



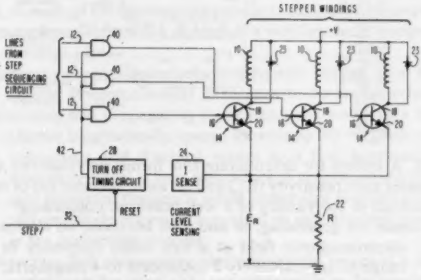
means and comprised of a number of stitches determined by the setting of said stitch-number selector means.

4,107,593

CURRENT CONTROL CIRCUIT

Eric G. Anderson, Rochester, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Apr. 7, 1977, Ser. No. 785,661
Int. Cl.[2] H02K *37/00*
U.S. Cl. 318—685 **10 Claims**



1. An electronic circuit for controlling the energization of an external load having at least two conductors, a sequencing circuit selecting which one of the conductors to be energized, said circuit comprising:

switching means for sequentially allowing the conductors to be energized whereby an electric current flows therethrough a selected one of the conductors; and

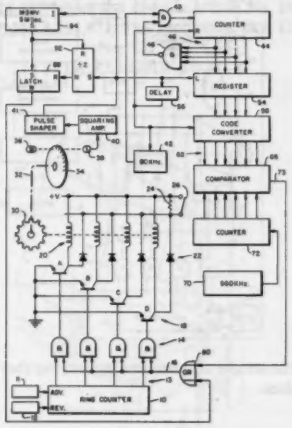
control means responsive to a predetermined amount of current flowing through the selected conductor for interrupting said energization for a predetermined time period, said switching means being responsive to said control means to allow said energization to continue after said predetermined time period until said predetermined amount of current again flows through the selected conductor wherein said control means interrupts said energization again for said predetermined time period.

4,107,594

STEP MOTOR VELOCITY CONTROL

Norman A. Jacobs, Arlington Heights, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Jan. 24, 1977, Ser. No. 762,069
Int. Cl.[2] G05B *19/40*
U.S. Cl. 318—685 **10 Claims**



2. In a system for operating a stepping motor having a rotor and a stator with a plurality of individually-wound sets of phase coils for conducting electrical current, each set being individually energized by an associated driver-amplifier in a predetermined sequence in order to advance the rotor by one unit increment each time the energization of the driver-amplifiers is incremented in the predetermined sequence, improved apparatus for controlling the output torque of the motor comprising:

means for generating a plurality of shaft pulses evenly spaced with respect to the angular positions of the rotor and within less than one unit increment of rotor rotation, said shaft pulses occurring at a rate commensurate with the speed of rotation of the rotor;

means for generating clock pulses at a rate substantially greater than the maximum rate at which shaft pulses are expected to be generated;

means for counting the number of clock pulses generated between successive shaft pulses; and

means responsive to the count for controlling the amount of energy supplied by the driver-amplifiers to their associated coil sets.

4,107,595

CURRENT CONTROL SYSTEM FOR A STEPPING MOTOR

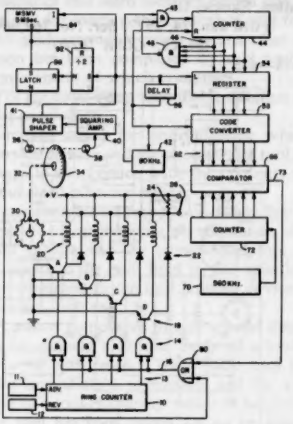
William T. Campe, Chicago, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Jan. 24, 1977, Ser. No. 762,065
Int. Cl.[2] H02K *29/04*
U.S. Cl. 318—696 **10 Claims**

9. An improved method of driving at a stepping rate a stepping motor having a plurality of windings each operated by an individually-associated switch each switch controlled by an associated switch-operating means to operate in a predetermined sequence, wherein the improved method includes the steps of:

generating a series of chopping pulses having a frequency substantially above the stepping rate and above the human-audible range and an ON-vs.-OFF duty cycle;

gating with the series of chopping pulses the control of each switch by its associated switch-operating means; and



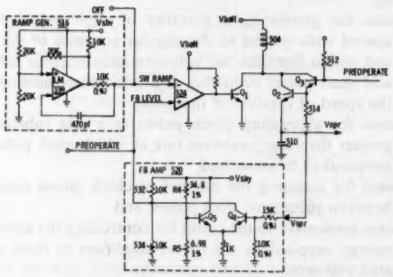
varying the torque of the motor by varying the duty cycle of the pulses.

4,107,596

EFFICIENT BIDIRECTIONAL POWER CONVERTER FOR PORTABLE DATA GATHERING APPARATUS

Daniel J. Weaver, San Jose, Calif.; Robert Treiber, Centerport, and Avner Wolanow, Melville, both of N.Y., assignors to The Singer Company, Binghamton, N.Y.

Filed Oct. 21, 1976, Ser. No. 734,693
Int. Cl.[2] G05F *1/56, 1/58*
U.S. Cl. 323—17 **14 Claims**



1. A bidirectional power converter responsive to an external standby-operate signal to provide an operate mode and a standby mode, and responsive to an internal periodic control signal for providing a step up-step down regulated dc output voltage to a load, the converter adapted to be powered by a battery having a voltage which varies as the battery discharges across a range transcending the value of the regulated dc output voltage, comprising:

signal means for providing the periodic control signal which is adjusted to define an input duty cycle time period and an output duty cycle time period;

input energy storage means which is charged by the battery during the input duty cycle and which is discharged during the output duty cycle;

input switching means responsive to the periodic control signal for establishing a charging path for the input energy storage means during the input cycle;

output energy storage means which is charged by transfer current generated by the discharge of the input energy storage means during the output cycle for providing the regulated output voltage to the load;

controlled output switching means having an ON low impedance state and an OFF high impedance state, connected in series between the input energy storage means and the output energy storage means, which obtains the ON low impedance state for the duration of each output duty cycle in response to the termination of the input duty cycle for providing a discharge path allowing the transfer current to flow between the energy storage means during the output duty cycle, and which obtains the OFF high impedance state for the duration of each input duty cycle in response to the termination of the output duty cycle for disrupting the discharge path to prevent the flow of transfer current during the input duty cycle, and which further obtains the OFF high impedance state for the duration of the standby mode in response to the standby-operate signal for isolating the load from the battery;

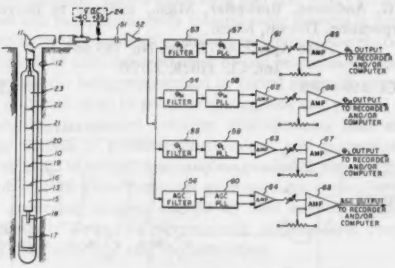
feedback means responsive to the regulated output voltage for adjusting the periodic control signal in response to variations in the regulated output voltage.

4,107,597

ELECTROMAGNETIC WAVE PROPAGATION WELL LOGGING UTILIZING MULTIPLE PHASE SHIFT MEASUREMENT

Richard A. Meador, Houston; Larry L. Adams, Stafford; Percy T. Cox; Larry W. Thompson, both of Houston, and James A. Fuchs, Missouri City, all of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 13, 1976, Ser. No. 749,845
Int. Cl.[2] G01V *3/18, 3/12*
U.S. Cl. 324—6 **6 Claims**



1. A system for determining true formation resistivity (R_t), flushed zone resistivity (R_{xo}) and invasion diameter (d_i) of earth materials in the vicinity of a well borehole, comprising:

means for generating, in said well borehole, an alternating electromagnetic field at a first radio frequency in the range of approximately 2 megahertz to 4 megahertz;

means for detecting, in said well borehole, phase differences of the total electromagnetic field generated by said field generating means at relatively short, intermediate and long radial depths into the earth material surrounding said borehole and detecting means including pairs of receiver coils at longitudinally short, intermediate, and long spaced distances from said field generating means;

means, connected to said detection means, and comprising receiver and amplifier means for receiving signals from each of said coils of said pairs of coils and converting said signals to signals of a second frequency having constant output amplitudes, for generating signals representative of said phase differences at said short, intermediate and long radial depths, respectively;

means, connected to said signal generating means for transmitting said short, intermediate and long phase difference signals to the earth's surface; and

means responsive to said short, intermediate and long phase

difference signals for computing R_p, R_{xo} and d_i of said earth materials in the vicinity of said well borehole.

4,107,598

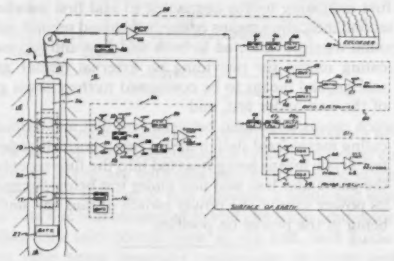
ELECTROMAGNETIC WAVE LOGGING SYSTEM FOR DETERMINING RESISTIVITY AND DIELECTRIC CONSTANT OF EARTH FORMATIONS

Richard A. Meador, Houston; Larry L. Adams, Stafford; James A. Fuchs, Missouri City; Percy T. Cox, and Larry W. Thompson, both of Houston, all of Tex., assignors to Texaco Inc., New York, N.Y.

Continuation of Ser. No. 654,450, Feb. 2, 1976, abandoned. This application May 25, 1977, Ser. No. 800,500

Int. Cl.[2] G01V *3/18, 3/12*

U.S. Cl. 324—6 **4 Claims**



1. A method for determining the electromagnetic properties of earth formations in the vicinity of a well borehole, comprising the steps of:

generating propagating electromagnetic waves at a frequency of approximately 30 megahertz in a well borehole;

detecting said propagating electromagnetic waves at a first shorter longitudinally spaced location in the borehole and converting said detected waves to a first intermediate frequency signal at least two orders of magnitude less than said generated frequency while preserving absolute phase and amplitude information present on said detected waves in the conversion process;

detecting said propagating electromagnetic waves at a second, longer longitudinally spaced location in the borehole and converting said detected waves to a second, different frequency, intermediate frequency signal at least two orders of magnitude less than said generated frequency while preserving absolute phase and amplitude information present on said detected waves in the conversion process;

transmitting said first and second intermediate frequency signals to the surface of the earth;

receiving, at the surface of the earth, said first and second intermediate frequency signals and extracting therefrom the unnormalized ratio of the amplitude components present at said first and second longitudinally spaced locations in the borehole and the relative phase shift of said propagating waves between said first and second longitudinally spaced locations in the borehole; and

recording said unnormalized amplitude ratio and said relative phase shift as a function of borehole depth.

4,107,599

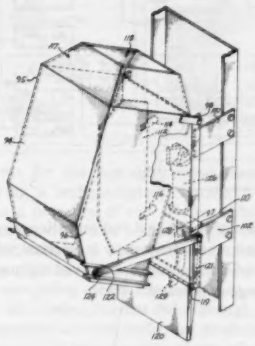
ELECTRODE FOR AN IMPEDANCE MEASURING APPARATUS

Fritz K. Preikschat, 16020 Lake Hills Blvd., Bellevue, Wash. 98008

Continuation-in-part of Ser. No. 483,094, Jun. 26, 1974, Pat. No. 3,992,665, which is a division of Ser. No. 395,736, Sep. 10, 1973, Pat. No. 3,824,461, which is a division of Ser. No. 299,133, Feb. 24, 1972, Pat. No. 3,781,671. This application Oct. 12, 1976, Ser. No. 731,756

Int. Cl.[2] G01R *27/26*

U.S. Cl. 324—61 R **17 Claims**



1. An electrode which is part of an apparatus for measuring the impedance of a sample of material, said electrode being formed as a sample box for receiving a sample of material through which an electrical field is radiated, comprising:

front, rear and a pair of opposed, flat side walls of conductive material, together forming a rectangular container in which material to be tested is deposited;

an inlet means situated at one end of said sample box, including an opening which is sized to receive a sample of material therethrough;

an outlet means situated at the other end of said sample box, adapted to exhaust the sample of material after its electrical impedance has been measured; and,

a flat electrode plate of conductive material mounted within said sample box and situated with its surfaces substantially parallel with and substantially equidistant from said opposed, flat side walls, said electrode plate being electrically insulated from the walls forming said sample box.

4,107,600

ADAPTIVE FREQUENCY TO DIGITAL CONVERTER SYSTEM

William Thomas McMannis, Springdale, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Dec. 13, 1976, Ser. No. 750,066

Int. Cl.[2] G01R *23/02*

U.S. Cl. 324—78 R **20 Claims**

1. A method of converting a plurality of AC signals within a frequency range of interest to respective digital signals each having a binary value proportional to the frequency of a corresponding AC signal comprising:

(a) selecting a first AC signal

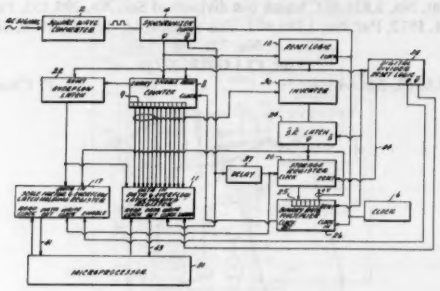
(b) generating a stream of pulses at a first clock frequency

(c) counting the number of pulses generated during a specified period of the selected AC signal and storing the count in a register of predetermined size

(d) generating a stream of pulses at a new clock frequency determined by using the generated count to compute a value for increasing the first clock frequency by an amount calculated to generate a cumulative total of clock

pulse during said specified period sufficient to use most bit positions of said register

(e) counting the number of pulses generated at the new clock frequency during a subsequent period of equal duration to said specified period, and



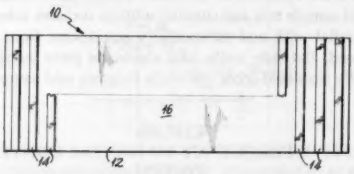
(f) selecting a new AC signal and repeating steps (a) through (e) each time a new frequency is selected whereby a high resolution of conversion is achieved throughout the frequency range of interest.

4,107,601

SELF-ADJUSTING EXCITER BAND FOR SHAFT SPEED MAGNETIC PICKUP

Harold J. Barmeier, Jr., Ballwin, and David A. Wright, Frontenac, both of Mo., assignors to National Marine Service, Inc., St. Louis, Mo.

Filed Jan. 21, 1977, Ser. No. 761,199
Int. Cl.[2] G01P *3/48*
U.S. Cl. 324—173 **9 Claims**



1. An exciter for use with a shaft speed magnetic pickup comprising:

(a) a flexible strip of material that is uniformly stretchable at least along its length, the strip having opposite ends and being adapted to be wrapped about and secured to a rotatable shaft;

(b) a plurality of separate, substantially uniformly spaced magnetic elements secured to the strip so as to face towards one side of the strip along its length;

(c) fastening means for holding the ends of the strip in predetermined relationship with respect to each other when the strip has been wrapped about a shaft; and

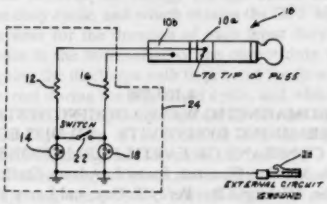
(d) the magnetic elements most adjacent each end of the strip being spaced from the respective strip ends such that when the strip ends are held together in said predetermined relationship all the magnetic elements are substantially evenly spaced from one another.

4,107,602

PROBE MEANS UTILIZED WITH A PAIR OF INDICATORS FOR TESTING THE WIRING CONNECTIONS OF A FUSE RECEPTACLE

David M. Evans, PSC BOX 5095 APO, San Francisco, Calif. 96519

Filed Sep. 29, 1976, Ser. No. 727,817
Int. Cl.[2] G01R *31/02*
U.S. Cl. 324—51 **5 Claims**



1. A fuse safety tester apparatus comprising in combination:

a test probe means having a first and second member adjacent to each other, said first member being electrically connected to the tip of said test probe means, said first and second member being electrically insulated from said each other,

a first indicating means connected to said first member,

a second indicating means connected to said second member,

ground means connected to both said first and second indicating means for providing an external circuit ground, said ground means to be connected to the chassis ground of the unit under test, and

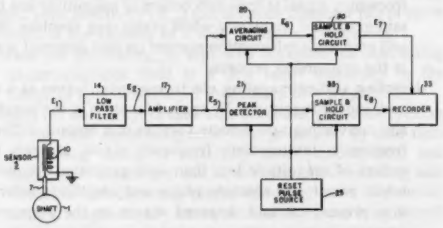
switch means connected between said first and second indicating means, said switch means being normally open, said test probe means being inserted into the fuse receptacle of the unit under test, said unit under test being connected to its power source, the power switch of said unit under test being in the power on position.

4,107,603

ELECTROMAGNETIC MEANS AND METHOD FOR DETECTING PROPELLER SHAFT BEARING WEAR

Carlton M. Slough, Spring, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Nov. 26, 1976, Ser. No. 745,263
Int. Cl.[2] G01R *33/12*
U.S. Cl. 324—207 **6 Claims**



1. Apparatus for the monitoring of the wear of a shaft bearing while the shaft is rotating, comprising a magnetic noncontacting means for sensing displacement of the rotating shaft with respect to the shaft's longitudinal axis and providing a corresponding displacement signal reset pulse means for providing reset pulses; means connected to the sensing means and to the reset pulse means for averaging the displacement signal to provide an average displacement signal, said averaging means includes an averaging circuit means connected to the sensing means and to the reset pulse means for averaging the displacement signal in accordance with the reset pulses, and

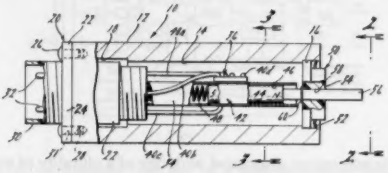
sample and hold means connected to the averaging circuit means and to the reset pulse means for sampling and holding the signal from the averaging circuit means in response to the reset pulses to provide the average displacement signal; and means for recording the average displacement signal to provide a record so that changes in the shaft displacement can be determined so as to monitor wear of the shaft bearing.

4,107,604

HALL EFFECT DISPLACEMENT TRANSDUCER USING A BAR MAGNET PARALLEL TO THE PLANE OF THE HALL DEVICE

Donald R. Bernier, Lake Orion, Mich., assignor to Compunetics, Incorporated, Troy, Mich.

Filed Dec. 1, 1976, Ser. No. 746,249
Int. Cl.² G01R 33/12
U.S. Cl. 324—208 **9 Claims**



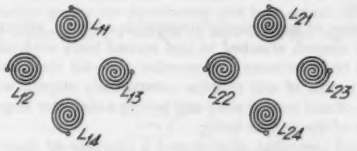
1. A position indicating device comprising: a housing having a central bore, an electrical connector connected to one end of said housing in registry with said bore for providing electrical connection into and out of said housing, a guide and support tube having one end connected to said electrical connector and extending into said central bore at one end, said guide and support tube being generally rectangular in cross section, sensing means responsive to changes in magnitude of magnetic flux for providing an output signal varying in magnitude in accordance with the changes in magnitude of magnetic flux, said sensing means secured to the outer surface of said guide and support tube and magnet means located within said support tube for movement relative to said sensing means whereby the variations in magnitude of said output signal will be provided as a function of the relative position between said magnet means and said sensing means, display means operatively connected with said sensing means and responsive to said output signal for providing a display of the magnitude of the relative position between said magnet means and said sensing means, said magnet means comprising a bar magnet extending longitudinally along an axis and having a circular cross section and a support tube structure fixedly holding said bar magnet, said support tube structure having a generally rectangular cross section and being located within said guide and support tube for relative sliding movement therein, said magnet means including a return, coil spring connected with one end of said bar magnet and engageable with said electrical connector, a cap located in the opposite end of said central bore, a pin slidably supported in said cap and engageable with the opposite end of said bar magnet whereby axial movement of said pin will result in movement of said bar magnet relative to said sensing means, said sensing means comprising a Hall effect device secured to said guide and support tube with its Hall plate parallel to the axis of said bar magnet, said bar magnet having only one north magnetic pole located at one end and only one south magnetic pole located at the opposite end, said output signal indicating a null when said Hall plate is located substantially centrally of said north and south poles.

4,107,605

EDDY CURRENT FLAW DETECTOR UTILIZING PLURAL SETS OF FOUR PLANAR COILS, WITH THE PLURAL SETS DISPOSED IN A COMMON BRIDGE

Robert John Hudgell, Warrington, England, assignor to British Gas Corporation, England

Filed Oct. 13, 1976, Ser. No. 731,892
Claims priority, application United Kingdom, Oct. 15, 1975, 42162/75
Int. Cl.² G01R 33/12
U.S. Cl. 324—220 **2 Claims**



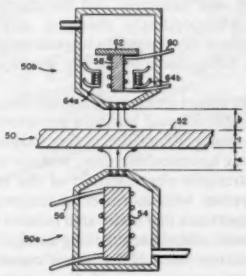
1. Apparatus for the non-destructive testing of metallic pipelines having a body adapted to tranverse a pipeline, a probe bearing a plurality of sets of four substantially planar spiral coils mounted on said body by probe mounting means for holding said coils each with its axis substantially normal to a surface of a pipeline while urging said probe towards said surface, coil energizing means for energizing said coils by the passage of an alternating current therethrough, magnetic biasing means, mounted on said body, for producing a magnetic field in the vicinity of said plurality of sets of coils, and detector means mounted on said body, the shape of the coils substantially conforming to the shape of the surface of the pipeline under test, each coil of each said set of four coils being arranged with its respective axis at a respective corner of a square and said plurality of sets of coils being connected in a single bridge circuit with each coil of each set being disposed in a different arm of the bridge with said detector means connected across said bridge circuit so that the sensitivity of said detector means to differences in spacing of said coils and the surface under test is reduced.

4,107,606

NON-CONTACTING ELECTROMAGNETIC THICKNESS GAUGE FOR SHEET MEASUREMENT HAVING IMPROVED SMALL DISTANCE SENSITIVITY

Pekka Matti Typpo, and Gunnar Wennerberg, both of Cupertino, Calif., assignors to Measurex Corporation, Cupertino, Calif.

Continuation-in-part of Ser. No. 750,390, Dec. 14, 1976, abandoned. This application Jul. 27, 1977, Ser. No. 819,469
Int. Cl.² G01R 33/12
U.S. Cl. 324—229 **5 Claims**



1. An apparatus for non-contacting measurement of the thickness of a sheet of a non-magnetic material comprising:
a first body of a magnetically susceptible material, substantially cylindrical in shape, to one side of said sheet; said

first body aligned such that the axis of the cylinder is substantially perpendicular to said sheet;

a first electrical wire wound a plurality of times about said first body, capable of being energized to produce a magnetic field;

means for holding said first body at a constant distance apart from said sheet;

a second body of a magnetically susceptible material, substantially cylindrical in shape, having a diameter less than the diameter of the first body, to other side of said sheet; said second body positioned such that the axis of the cylinder is substantially aligned with the axis of the first body;

a member of magnetically susceptible material, substantially disk shaped, attached to said second body with said second body between said member and said sheet and with the center of said member substantially aligned with the axis of said second body and having a diameter larger than that of the second body;

a second electrical wire wound a plurality of times about said second body, said second wire capable of detecting the amplitude of said magnetic field, said field detected determinative of the thickness of said sheet; and

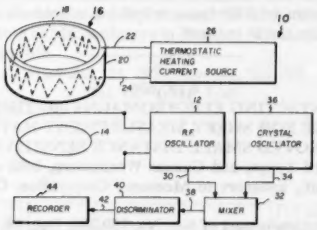
means for maintaining said second body at a constant distance apart from said sheet.

4,107,607

MAGNETOMETER USING A FIELD CONTROLLED OSCILLATOR, THE OSCILLATOR CORE BEING MAINTAINED NEAR ITS CURIE POINT

James L. Kirkland, Panama City, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 26, 1977, Ser. No. 836,829
Int. Cl.[2] G01R *33/02*
U.S. Cl. 324—253 **4 Claims**



1. A magnetometer of the type including oscillator means having an induction coil as part of an operating frequency determining resonant circuit, and magnetic field sensor means associated with said induction coil for changing inductance thereof and correspondingly changing said operating frequency in response to changes in a weak magnetic field, said magnetometer being characterized by the improvement comprising:

said oscillator means comprising a radio frequency oscillator and said induction coil having a predetermined radius;

said sensor means comprising a ferromagnetic sensor element having a permeability that, when in a weak magnetic field of strengths characteristic of the earth's magnetic field, increases with increases in temperature toward a Curie temperature that is elevated relative to normal room temperatures, said element having a magnetic induction B to magnetizing force H hysteresis curve at a predetermined temperature near said Curie temperature that is characterized by a steep slope in the region of said weak magnetic field;

means for heating said element so as to maintain the temperature of said element constant at said predetermined temperature, whereby small changes in said weak magnetic field produce large changes in said inductance and said operating frequency; and

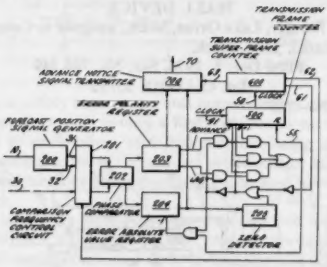
said element being substantially free of any magnetic field biasing means or field concentrator means.

4,107,608

METHOD AND APPARATUS FOR BURST SYNCHRONIZATION IN A TIME DIVISION MULTIPLE ACCESS COMMUNICATION SYSTEM

Akio Saburi, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Dec. 6, 1976, Ser. No. 747,822
Claims priority, application Japan, Dec. 10, 1975, 50-147569
Int. Cl.[2] H04J *3/06*
U.S. Cl. 325—4 **4 Claims**



1. A synchronizer associated with one of a plurality of member stations in a time division multiple access communication system of the type including said plurality of member stations and a repeater, said repeater sequentially receiving signal bursts from each of said member stations and retransmitting said signal bursts to all of said member stations whereby each of said member stations communicates with the remaining said member stations by transmitting signal bursts to and receiving signal bursts from said repeater, one of said member stations generating a reference signal for identifying a reference time slot in a super-frame comprising a plurality of time slots, each of said member stations being assigned a different one of said time slots, said one of a plurality of member stations also including means for transmitting a frame position synchronizing signal to said repeater, said synchronizer circuit comprising:

means responsive to reception of said reference signal from said repeater and for generating both a reference forecast gate signal and a reference forecast position pulse in response to said reference signal, said reference forecast position pulse being representative of a predicted position of the time slot to which said one of said member stations is assigned, said reference forecast position pulse occurring within the time period when said reference forecast gate signal is present;

means responsive to receipt of said frame position synchronizing signal from the repeater for generating a detection pulse representing the actual position occupied by the station's burst signals;

measurement initiation means responsive to the generation of said detection pulse during the interval of said reference forecast gate signal for comparing said position pulse and said detection pulse and for generating polarity and magnitude signals, respectively, representative of the magnitude and polarity of the position of said detection pulse relative to the position of said forecast position pulse;

means responsive to said polarity and magnitude signals for controlling the instant at which said one of said member stations generates a signal burst containing both said frame position synchronizing signal and data information;

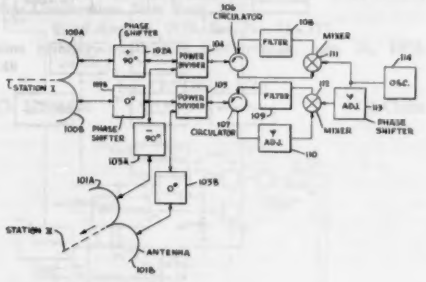
means responsive to predetermined counts of said frame pulses for generating correction gate signals, measurement gate signals and advance notice signals each being of

respectively different duration, and all occurring once within a super-frame interval whose duration is at least equal to twice the propagation time between a member station and the common repeater.

4,107,609
COMMUNICATIONS TRANSPONDER

Elliot L. Gruenberg, 6040 Boulevard East, New York, New York, N.J. 07093

Continuation-in-part of Ser. No. 545,623, Jan. 30, 1975, Pat. No. 4,001,691. This application Jan. 3, 1977, Ser. No. 756,375
Int. Cl.[2] H04B *7/14*
U.S. Cl. 325—14 **10 Claims**



1. A transponder, for use in a communication system for receiving and transmitting electromagnetic signals,

comprising, in combination:

first antenna means operative for receiving an electromagnetic first signal from a first direction and transmitting an electromagnetic second signal;

second antenna means operative for transmitting said second signal in a second direction; and

signal processing means coupling said first and said second antenna means to each other and including means for receiving said first signal from said first antenna means, means for phase shifting said first signal to said second signal, means for coupling said second signal to said first antenna means to produce said second transmitting signal, said second transmitted signal possessing a relative null in the radiated spatial electromagnetic power density distribution in said first direction, and means for coupling said second signal to said second antenna means to produce said second transmitted signal, said second transmitted signal possessing a relative maximum in the radiated spatial electromagnetic power density distribution in said second direction.

4,107,610
DATA TRANSMISSION SYSTEM USING A SEQUENTIAL APPROXIMATION ENCODING AND DECODING TECHNIQUE

Donald R. Weber, Saratoga, Calif., assignor to Dacom, Inc., Santa Clara, Calif.

Continuation of Ser. No. 342,854, Mar. 19, 1973, which is a continuation of Ser. No. 66,459, Aug. 24, 1970, abandoned. This application Dec. 31, 1975, Ser. No. 645,604
Int. Cl.[2] H03K *13/22*
U.S. Cl. 325—38 R **10 Claims**

1. An encoding and decoding system, comprising:

an encoding means for generating an encoded signal in response to an analog input signal applied thereto, said encoding means including,

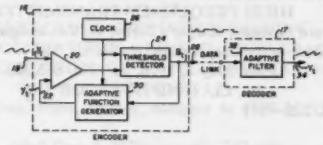
comparator means responsive to said input signal and a feedback signal for developing an error signal commensurate with the relationship between said input signal and said feedback signal,

detecting means responsive to said error signal for developing said encoded signal,

means for developing a cross-over signal in response to said error signal indicating a cross-over of said feedback signal and said input signal,

adaptive function generating means responsive to said encoded signal for developing said feedback signal, said feedback signal being comprised of the summation of a base signal component and a changeable reference signal component,

said adaptive function generating means including, voltage divider means for developing said base signal component by recirculating a sample of said feedback signal within



said function generating means, which sample occurs in response to derivation of said cross-over signal, and forming the next feedback signal by sequentially dividing down the feedback sampled signal and adding to said feedback sampled signal, serving as said base signal component, a positive or negative divided down reference signal to derive a summation signal, the polarity of said reference signal changing with each crossover signal;

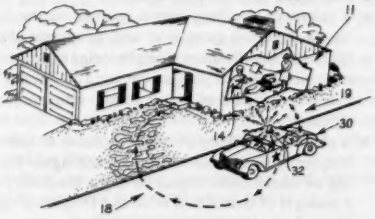
decoding means responsive to said encoded signal and operative to develop an analog output signal which is commensurate with said analog input signal; and

data linking means for transferring said encoded signal from said encoding means to said decoding means.

4,107,611
POLICE PROTECTION METHOD AND APPARATUS

Jack N. Holcomb, Galt Towers, Ocean Dr., Fort Lauderdale, Fla. 33308, and Hans D. Sylten, Fort Lauderdale, Fla., assignors to Jack N. Holcomb, Ft. Lauderdale, Fla.

Filed Dec. 6, 1973, Ser. No. 422,275
Int. Cl.[2] H04B *1/00*
U.S. Cl. 325—55 **8 Claims**



1. The method for providing the record of interrogation and activity by police officers, and protection to such officers, during investigations, including: a. replacement of an automatically activated transmitter in the officer's clothing; b. interrogation of an individual by an officer while carrying said transmitter; c. transmission by said transmitter to a receiver especially tuned to the wave length of the transmitter and located at a distance from said transmitter; d. recording the received transmission by means of a tape recorder operating in conjunc-

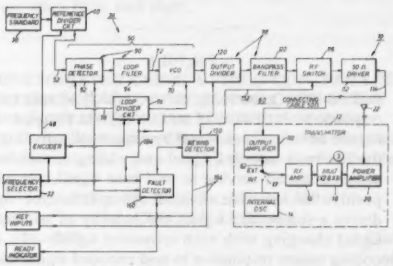
tion with, and receiving through, the receiver, the transmission from the transmitter; e. preserving the recording thus obtained for use in the future.

4,107,612

PHASE LOCKED LOOP EXCITER GENERATOR FOR HIGH FREQUENCY TRANSMITTER

J. Howard Leveque, Harper's Ferry, W. Va., assignor to Frederick Electronics Corporation, Frederick, Md.

Filed May 5, 1976, Ser. No. 683,383
Int. Cl.[2] H04B *1/04*; H03B *3/06*
U.S. Cl. 325—171 **12 Claims**



1. A phase locked loop signal generator for exciting a radio wave transmitter to transmit over selectable frequency ranges in response to an exciter signal of a variable frequency comprising:

signal input means for generating a frequency selector signal having a value indicative of the desired frequency at which the transmitter is to transmit;

a frequency standard signal generator for providing a frequency standard signal characterized by a highly stable, unvarying frequency; and

an enable signal generator responsive to the frequency standard signal and to the frequency selector signal for generating the exciter signal of a preselected frequency, the enable signal generator including

a. a reference dividing circuit coupled to the frequency standard signal generator and programmable in response to said frequency selector signal for providing a reference frequency signal having a frequency which is a fractional part of that of said frequency standard signal;

b. a phase locked loop circuit responsive to the reference frequency signal and to the selector signal for producing an intermediate signal having a frequency which is a multiple of that of said reference frequency signal, said phase locked loop circuit including a programmable loop divider circuit for producing a divided down intermediate signal of a frequency which is divided down from that of said intermediate signal to a value determined by said value of the frequency selector signal; and

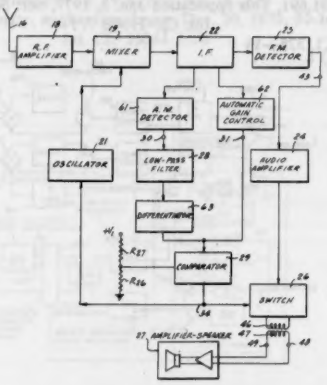
c. output divider circuit means coupled to the phase locked loop circuit for generating the exciter signal, the frequency of the exciter signal being a fractional value of that of said intermediate signal and determined at least in part by said frequency selector signal.

4,107,613

WIRELESS MICROPHONE WITH FM RECEIVER MUTING SYSTEM RESPONSIVE TO EXCESSIVE UNDESIRED AM LEVEL OR LOW AGC CONTROL LEVEL

Daniel L. Queen, Chicago, and Kenneth W. Belt, Berwyn, both of Ill., assignors to Perma-Power Inc.

Filed Feb. 11, 1977, Ser. No. 767,972
Int. Cl.[2] H04B *1/10*
U.S. Cl. 325—348 **9 Claims**



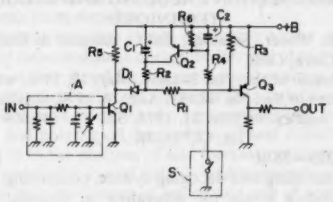
8. An audio muting system for a remote microphone including an FM transmitter and a receiver having an I.F. section, an F.M. detector, an automatic gain control, an A.M. detector to detect undesired amplitude modulation, said F.M. detector, said automatic gain control and said A.M. detector receiving inputs from said I.F. section, and an audio output comprising a comparator receiving the outputs of said A.M. detector and said automatic gain control, and switch means connected between the output of said F.M. detector and said audio output and controlled by said comparator such that said audio output is disconnected when the output of said A.M. detector exceeds a predetermined level or when the output of said automatic gain control falls below a predetermined level, including a low-pass filter connected between said A.M. detector and said comparator.

4,107,614

MUTING CONTROL CIRCUIT FOR FM RECEIVER

Yoshiro Sugai, Kawagoe, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 15, 1977, Ser. No. 777,802
Claims priority, application Japan, Mar. 17, 1976, 51/32107
Int. Cl.[2] H04B *1/16*
U.S. Cl. 325—348 **4 Claims**



1. In a muting control circuit for an FM receiver including first switch means for detecting when the magnitude of a received FM signal falls below a predetermined threshold level, and second switch means for generating a muting control

signal in rapid response to the first means, the improvement characterized by:

(a) means for delaying the turn-off response of the second switch means,

(b) means for detecting the performance of a station selection or tuning operation in the receiver, and

(c) means for disabling the delay means in response to the performance detecting means.

4,107,615

RECEIVER INCLUDING AN AUTOMATIC TUNING CORRECTION SUPPRESSION CIRCUIT COUPLED TO THE TUNING MEMBER

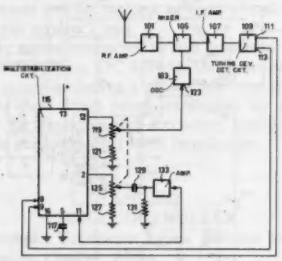
Arnoldus Garskamp, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 16, 1976, Ser. No. 714,771

Claims priority, application Netherlands, Aug. 28, 1975, 7510149

Int. Cl.[2] H04B *1/16*

U.S. Cl. 325—420 **1 Claim**



1. A circuit for use with an automatic tuning correction means, said circuit comprising a tuning potentiometer; an automatic tuning correction suppression circuit means coupled to said potentiometer and said automatic tuning correction means for rendering the automatic tuning correction means inactive during operation of said potentiometer and having a control signal input; and a level variation detector circuit having a level adjusting potentiometer mechanically coupled to said tuning potentiometer and electrically coupled to said suppression circuit means, said detector circuit also having an output coupled to said control signal input.

4,107,616

SIGNAL MONITORING CIRCUIT

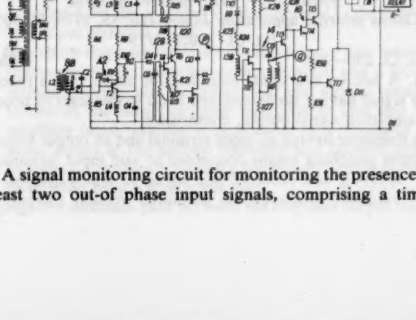
Ernest James Moorey, Ivybridge, England, assignor to M. L. Engineering (Plymouth) Limited, Plymouth, England

Filed Jan. 18, 1977, Ser. No. 760,391

Claims priority, application United Kingdom, Jan. 22, 1976, 2436/76

Int. Cl.[2] H03K *17/28*

U.S. Cl. 328—110 **4 Claims**



1. A signal monitoring circuit for monitoring the presence of at least two out-of phase input signals, comprising a timer device, a control circuit controlling the operation of the timer device, the control circuit having an enabling input, means combining two out-of-phase signals in a sequential manner derived from said input signals to be monitored, said combining means being connected to the said enabling input of the control circuit to enable the latter and initiate operation of the timer device upon receipt of one of said input signals for a predetermined time, said combining means continuing said enabling input longer than said predetermined time only when the rest of said input signals are thereafter sequentially received, said timer device providing an output signal from the monitoring circuit only when the control circuit is enabled for said predetermined time interval, timed by the timer device, corresponding to the application of all the input signals sequentially to the enabling input.

4,107,617

CONTROLLED-FREQUENCY FEEDING ARRANGEMENT FOR A LINEAR ACCELERATOR USING STATIONARY-WAVE ACCELERATING SECTIONS

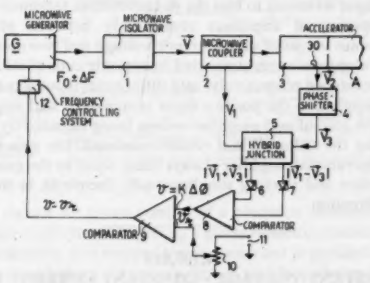
Duc Tien Tran, Paris, France, assignor to CGR-MeV, Paris, France

Filed Dec. 3, 1976, Ser. No. 747,195

Claims priority, application France, Dec. 5, 1975, 75 37319

Int. Cl.[2] H05H *7/02, 9/04*

U.S. Cl. 328—233 **3 Claims**



1. A controlled-frequency feeding arrangement for feeding a charged-particle accelerator, said accelerator including a particle source providing a particle beam, n stationary-wave accelerating sections constituted with resonant cavities and means for injecting a microwave signal $\vec{V}_0$ issuing from a microwave generator G into one of said accelerating sections, said microwave arrangement comprising means for extracting a fraction $\vec{V}_1$ of said microwave signal $\vec{V}_0$ issuing from said microwave generator and intended to be injected into the first of said n accelerating sections, means for extracting a fraction $\vec{V}_2$ of the microwave signal stored in said first accelerating section loaded with said beam of particles and for phase-shifting said signal $\vec{V}_2$ by $\pi/2$ to obtain a signal $\vec{V}_3$, means for obtaining a continuous signal v of which the amplitude is proportional to the phase shift $\Delta\phi$ created between the microwave signals $\vec{V}_1$ and $\vec{V}_3$, means for comparing the signal v with a reference signal v_r and for determining an error signal $v - v_r$ and means for controlling the operating frequency of said microwave generator by means of said error signal $v - v_r$.

4,107,618

AMPLIFIER SYSTEM HAVING SIGNAL GAIN INDEPENDENT OF A REFERENCE VOLTAGE

Alfred Newman Ormond, 11969 E. Rivera Rd., Santa Fe Springs, Calif. 90670

Filed Aug. 4, 1977, Ser. No. 821,632

Int. Cl.[2] H03F *3/45, 3/68*

U.S. Cl. 330—51 **3 Claims**

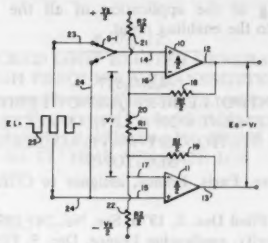
1. Am amplifier system to which a reference voltage and

differential input signal are applied and wherein the gain of said amplifier system can be varied to vary the amplification of said differential input signal without affecting said reference voltage, including, in combination:

(a) first and second operational amplifiers having outputs and positive input terminals and negative input terminals;

(b) first and second negative feedback fixed value resistances connected directly between the outputs and negative input terminals of said operational amplifiers respectively; and

(c) resistance means across which said reference voltage is applied, said resistance means including a center resistance



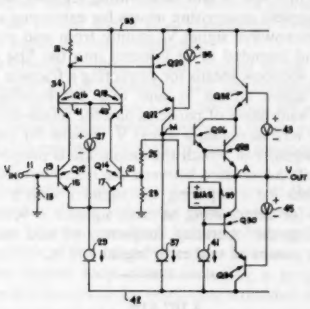
with tap points on either side connecting to the negative input terminals to bias the negative input terminals of said operational amplifiers respectively between plus and minus values of said reference voltage and two outer fixed value resistances connected to opposite ends of said center resistance respectively, said differential input signal being supplied to the positive input terminals of said amplifiers, the gain of said amplifier system being adjusted by adjusting the value of said center resistance, the gain in each operational amplifier always being equal to the gain in the other and varying simultaneously therewith in the same direction.

4,107,619

CONSTANT VOLTAGE - CONSTANT CURRENT HIGH FIDELITY AMPLIFIER

Nelson S. Pass, Sacramento, Calif., assignor to Threshold Corporation, Sacramento, Calif.

Filed Dec. 20, 1977, Ser. No. 862,406
Int. Cl.² H03F *3/45*
U.S. Cl. 330—255 **11 Claims**



1. A high fidelity audio amplifier comprising,

a transistor input stage having a signal input terminal and a low level signal output node,

a transistor voltage gain stage having first and second transistors connected in cascode with a first constant voltage source means in parallel therewith for producing a constant V_{CE} drop in said first transistor, said transistor voltage gain stage connected to said low level signal output node and having an intermediate signal output node and

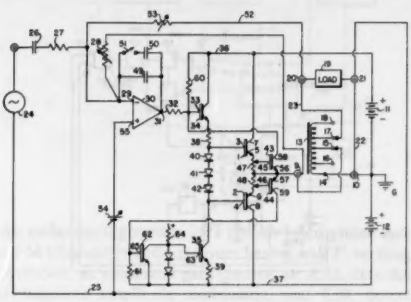
a transistor power amplifier stage having third and fourth transistors connected in cascode with a second constant voltage source means in parallel therewith for producing a constant V_{CE} drop in said third transistor, said transistor power amplifier stage connected to said intermediate signal output node and having a final signal output node wherein a nominal amount of output current is delivered.

4,107,620

REGULATED POWER SUPPLY WITH AUTO-TRANSFORMER OUTPUT AND DIRECT CURRENT FEEDBACK

Paul Birman, and Sarkis Nercessian, both of Flushing, N.Y., assignors to Forbro Design Corp., New York, N.Y.

Filed Oct. 12, 1976, Ser. No. 731,461
Int. Cl.² H03F *1/34, 3/30*
U.S. Cl. 330—265 **3 Claims**



1. In a bipolar power amplifier, the combination of;

a pair of power transistors connected in series across a source of positive bias and a source of negative bias also connected in series;

an autotransformer at least a part of which is conductively connected between the common point between said two transistors and the common point between said positive and negative sources of bias;

bipolar direct coupled driving means coupled to the input means of said two transistors including amplifier means responsive to degenerative feedback;

a load means connected across at least a portion of said autotransformer;

and first feedback means directly connected between one side of said load means and a point in said amplifier means such that a degenerative circuit is created;

and wherein the connection between said load and said autotransformer is a line exhibiting a significant impedance in comparison with the impedance of said load.

4,107,621

MICROWAVE SIGNAL AMPLIFIER

Nagahisa Furutani, Kawasaki; Kazuo Takahara; Yoshikazu Doi, both of Yokohama, and Haruo Yokouchi, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 9, 1977, Ser. No. 805,014
Claims priority, application Japan, Jun. 15, 1976, 51/70120
Int. Cl.² H03F *3/19*
U.S. Cl. 330—296 **7 Claims**

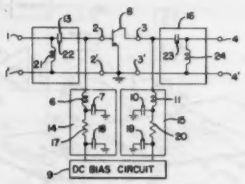
1. A microwave signal amplifier for amplifying a received line signal having predetermined band frequencies to produce an amplified signal output, comprising:

a transistor having an input terminal and an output terminal;

input matching means connected to said input terminal for applying said received line signal to said transistor, said transistor producing an amplified version thereof, said

input matching means including a first high pass filter for filtering out low frequency components lower than the predetermined band frequencies and for making an open circuit to said low frequency components from the input terminal;

output matching means connected to said output terminal for converting said amplified version into said amplified signal output, said output matching means including a



second high pass filter for filtering out said low frequency components and for making an open circuit thereto from the output terminal; and

bias supply means connected to said input and output terminals for supplying DC bias to said transistor, said bias supply means including a pair of low pass filters, each of said low pass filters being terminated by a termination resistor for blocking high frequency components higher than the predetermined band frequencies.

4,107,622

TONE CONTROLLER

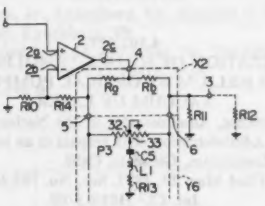
Kazuya Toyomaki, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Japan

Filed Oct. 28, 1976, Ser. No. 736,393

Claims priority, application Japan, Oct. 29, 1975, 50-129355

Int. Cl.² H03F *3/04*

U.S. Cl. 330—302 **15 Claims**



9. A tone controller for use in audio equipment comprising:

an input terminal adapted to be responsive to an audio frequency input signal,

an output terminal for deriving a tone controlled replica of the input signal,

a high gain amplifier having reversing and nonreversing input terminals and an output terminal for deriving an amplified signal, one of said amplifier input terminals being connected to said controller input terminal to be responsive to the audio frequency input signal, said amplifier output terminal being coupled to said controller output terminal so that the amplified audio frequency signal is supplied from the amplifier output terminal to the controller output terminal,

a frequency response control circuit having a first terminal connected to the amplifier output terminal and a second terminal, and means for connecting said second terminal to one of the amplifier input terminals so that said one amplifier input terminal is responsive to a replica of the audio signal at the second terminal, said control circuit including a reactance having a tendency to cause noise to be derived by the tone controller,

a negative feedback path between the amplifier output terminal and the reversing input terminal, said negative feedback path including a resistor having one terminal connected to one terminal of the tone control circuit, another terminal of the resistor being connected to supply a feedback voltage to said reversing terminal, said resistor suppressing the noise which tends to be derived by the control circuit.

4,107,623

PARALLEL ANALOG AND DIGITAL CONTROL LOOPS FOR PHASE LOCKING PRECISION OSCILLATOR TO REFERENCE OSCILLATOR

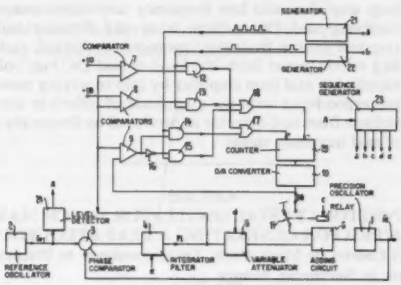
Erhard Graf, Bevaix, and Jean-Pierre Wiedmer, Neuchatel, both of Switzerland, assignors to Oscilloquartz Sa, Neuchatel, Switzerland

Filed Jun. 14, 1977, Ser. No. 806,495

Claims priority, application Switzerland, Jun. 24, 1976, 8081/76

Int. Cl.² H03B *3/04*

U.S. Cl. 331—1 A **8 Claims**



1. A device for phase control of a precision oscillator by a reference oscillator, comprising a phase detector connected to said oscillators, two control loops connected in parallel to the output of said phase detector, a first of said loops being digital and comprising a control bi-directional memory counter capable of being set by a phase error signal from said phase detector, and a second of said loops being analog and including an adjustable variable-gain circuit, and an adding circuit for forming the sum of the output signals of the said loops for simultaneously controlling the phase of the said precision oscillator.

4,107,624

AUTOMATIC FREQUENCY-TRACKING CIRCUIT

Paul F. Turner, North Salt Lake, Utah, assignor to Sperry Rand Corporation, New York, N.Y.

Filed Jul. 18, 1977, Ser. No. 816,419

Int. Cl.² H03B *3/04*

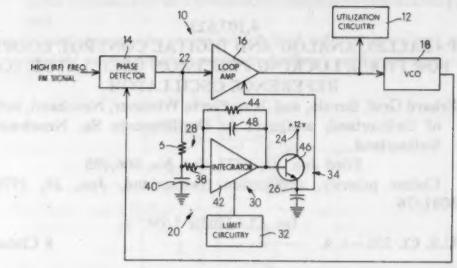
U.S. Cl. 331—8 **4 Claims**

4. A circuit for receiving an incoming signal incurring frequency drift and producing a local signal for tracking said incoming signal, comprising:

a phase-locked loop being defined by a phase detector, a DC amplifier and a voltage controlled oscillator connected in series, said detector receiving said incoming signal and a local signal generated by said oscillator and producing a DC voltage, said loop oscillator being controlled by said DC voltage produced by said detector and amplified by said amplifier such that said local signal generated by said oscillator locks on said incoming signal; and

correction means coupled to said loop in parallel with said loop amplifier and receiving said DC voltage from said detector such that a DC bias voltage produced by said correction means will be summed with that being fed into said amplifier from said detector so as to maintain the

optimum amplifier balance for the full operational tuning range of said amplifier even as offsets in the DC voltage fed to said amplifier from said detector are produced by frequency drift of said incoming signal, said correction means including low frequency responsive means coupled to said detector and bias voltage supplying means coupled between said low frequency responsive means and said



loop amplifier, said low frequency responsive means for receiving said DC voltage from said detector and, in response to low frequency components thereof, controlling within preset limits the level of said DC bias voltage supplied to said loop amplifier by said supplying means in correspondence with the magnitude of offsets in the DC voltage from said detector as produced by frequency drift of said incoming signal.

4,107,625

TRANSISTOR CRYSTAL OSCILLATOR WHICH MAY BE PAIRED FOR GENERATING A BEAT FREQUENCY

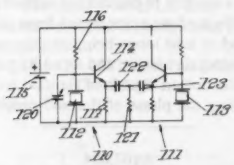
Henri Courier de Mere, Paris, France, assignor to Biscosa Societe de Recherche, France

Filed Feb. 23, 1977, Ser. No. 771,345

Claims priority, application France, Mar. 15, 1976, 76 07382; Mar. 15, 1976, 76 07383

Int. Cl.[2] H03B *5/36, 21/00*

U.S. Cl. 331—37 **8 Claims**



1. An oscillator circuit comprising a transistor, a piezoelectric element and a source of direct current, and wherein said transistor is connected in common collector configuration and said piezoelectric element is connected between the base of said transistor and a first terminal of said source, said oscillator circuit being characterized by a capacitive inpedance which sustains oscillation consisting exclusively of the capacitance of the base-emitter junction of said transistor, and the voltage of said source being no greater than 1.5 volts.

4,107,626

DIGITAL OUTPUT FORCE SENSOR USING SURFACE ACOUSTIC WAVES

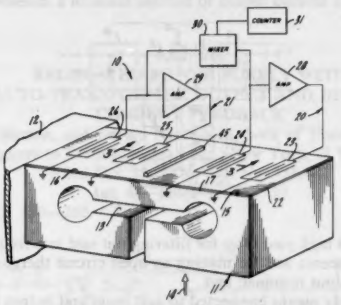
David A. Kiewit, Arlington Heights, Ill., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Dec. 20, 1976, Ser. No. 752,291

Int. Cl.[2] G01L *1/16;* **H03B** *5/32, 21/00*

U.S. Cl. 331—65 **7 Claims**

1. A sensor comprising, in combination, an elastic beam formed of metal anchored at one end and having a cross section such that a bending force near the other end causes a planar surface of the beam to undulate with a first portion of said surface being in tension and a second portion of said surface being in compression, transducers adhered to said beam surface and comprising interdigitated conductors formed at the surface of a piezoelectric layer, a pair of amplifiers respectively



coupling said transducers to form a pair of oscillator circuits including surface acoustic waves in a pair of wave paths between the transducers with the acoustic wave paths including, respectively, said first and second beam surface portions, and means for comparing the oscillating frequencies of said circuits and generating an output signal based on the frequency variation that will reflect the value of said bending force.

4,107,627

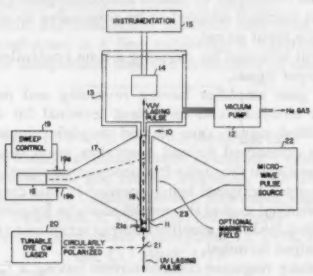
STABILIZATION OF $HE_2(A^3\Sigma_u^+)$ MOLECULES IN LIQUID HELIUM BY OPTICAL PUMPING FOR VACUUM UV LASER

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of and Jonas S. Zmuidzinas, Glendale, Calif.

Filed Mar. 29, 1977, Ser. No. 782,463

Int. Cl.[2] H01S *3/09*

U.S. Cl. 331—94.5 PE **14 Claims**

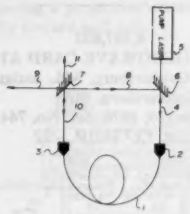


1. A method for achieving large populations of metastable spin-aligned $He_2(a^3\Sigma_u^+)$ molecules in superfluid helium comprising the steps of electronically exciting said helium with an electron beam and optically pumping said helium with a circularly-polarized beam of coherent light from a continuous-wave laser.

4,107,628
CW BRILLOUIN RING LASER

Kenneth O. Hill, Kanata; Brian S. Kawasaki, Carleton Place, and Derwyn C. Johnson, Ottawa, all of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed May 2, 1977, Ser. No. 792,928
Int. Cl.[2] H01S 3/30
U.S. Cl. 331—94.5 N **5 Claims**

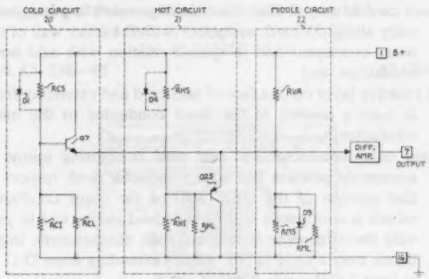


1. A cw Brillouin ring laser comprising:
a length of low loss optical fiber, having a first end and a second end;
pump laser means for directing a pump beam of optical energy into the first end of the optical fiber for generating a Brillouin shifted Stokes beam therein; and
first partially reflective mirror means and second partially reflective mirror means, being positioned to form a ring beam path with the first and second ends of the fiber, the first mirror means reflecting a portion of the Brillouin shifted Stokes beam eminating from the first end of the fiber to the second mirror means, and the second mirror means reflecting a portion of the received Brillouin beam into the second end of the fiber.

4,107,629
TEMPERATURE COMPENSATOR FOR A CRYSTAL OSCILLATOR

Russell L. Stone, Jr., Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.

Filed May 16, 1977, Ser. No. 796,888
Int. Cl.[2] H03B 5/36
U.S. Cl. 331—116 R **12 Claims**

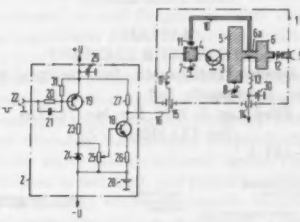


1. An improved temperature compensator for use with a crystal oscillator operating in a cold range, a middle range, and a hot range of temperature, said oscillator having at least one voltage sensitive capacitor associated therewith, said improved temperature compensator comprising:
a. voltage source terminals;
b. compensating voltage output terminals for connection to said voltage sensitive capacitor;
c. a middle temperature range compensating circuit comprising a current source circuit connected between said source voltage terminals, said current source circuit having a first path and a load path in series therewith, and temperature sensitive diode means connected to said first path for increasing the current through said load path in response to warmer temperatures and for decreasing the current through said load path in response to cooler temperatures;
d. a cold temperature range compensating circuit comprising a current source circuit connected between said voltage source terminals, said current source circuit having a first path and a load path in series therewith, and temperature sensitive diode means connected to said current source circuit for increasing the current through said load path in response to colder temperatures and for decreasing the current through said load path in response to warmer temperatures;
e. a hot temperature range compensating circuit comprising a current source circuit connected between said voltage source terminals, said current source circuit having a first path and a load path in series therewith, and temperature sensitive diode means connected to said current source circuit for decreasing the current through said load path in response to hotter temperatures and for increasing the current through said load path in response to cooler temperatures;
f. and means connected to each of said load paths for deriving middle, cold, and hot signals therefrom.

4,107,630
PULSE-MODULATED HIGH-FREQUENCY TRANSMITTER

Peter Schucht, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Sep. 15, 1977, Ser. No. 833,489
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1976, 2648767
Int. Cl.[2] G01S 7/28; H03B 5/18; H03K 7/08
U.S. Cl. 332—9 T **3 Claims**

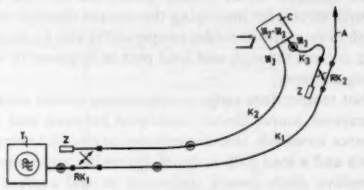


1. A pulse-modulated, high-frequency transmitter, comprising:
a self-sustained oscillator including a transistor having a grounded base, an emitter and a collector, a feedback circuit connected between said collector and said emitter including a strip line and a capacitor in series with said strip line, said strip line having a length equal to half the wavelength of the frequency of oscillation; and
keying means including a pulse modulator constructed as a constant current source connected to said emitter, and a pulse generator for keying said pulse modulator.

4,107,631
PROTECTION OF HIGH-POWER COAXIAL CABLES

Georg Spinner, and Leo Treczka, both of Munich, Fed. Rep. of Germany, assignors to Spinner GmbH Elektrotechnische Fabrik, Munich, Fed. Rep. of Germany

Filed Jul. 7, 1975, Ser. No. 593,270
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1974, 2433404
Int. Cl.[2] H03H 7/00
U.S. Cl. 333—17 R 2 Claims



1. In a high frequency transmission system comprising a high frequency and high power transmitter, an electrical output circuit, and a first coaxial cable for connecting said transmitter to said output circuit, a detection circuit for detecting flash-over and arcing in said first coaxial cable, said detection circuit comprising:

first and second directional couplers, said first directional coupler connected to one end of said first coaxial cable adjacent said transmitter, said second directional coupler being connected to said first coaxial cable at a point along said first coaxial cable which is removed from said end of said first coaxial cable adjacent said transmitter;

comparator circuit means having first and second inputs;

a second coaxial cable connecting the signal output of said first directional coupler to said first input of said comparator circuit means;

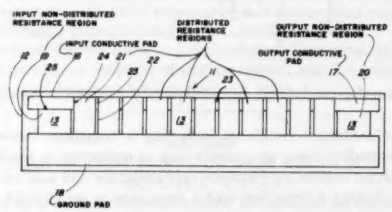
a third coaxial cable connecting the signal output of said second directional coupler to said second input of said comparator circuit means;

said first and second coaxial cables having different delay times, the delay time of said third coaxial cable being chosen such that said signal outputs of said first and second directional couplers are in phase when they are applied to said first and second input of said comparator circuit means whereby a predetermined difference between the magnitude of said signals applied to said comparator circuit means is indicative of a fault in said first coaxial cable.

4,107,632
ATTENUATOR ELEMENT

William P. Dawson, Indianapolis, Ind., assignor to Texscan Corporation, Indianapolis, Ind.

Filed Aug. 9, 1976, Ser. No. 712,726
Int. Cl.[2] H01P 1/22
U.S. Cl. 333—81 A 2 Claims

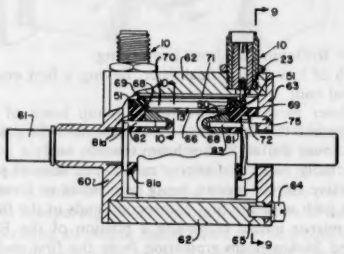


1. A flat attenuation element for high frequency electrical signals comprising a flat insulating base portion, an input conductive pad and an output conductive pad on the base portion, a common conductive pad on the base portion, a distributed resistance region coupled between said input and output conductive pads and also coupled directly to said common conductive pad, an input resistance region coupled in shunt between the input pad and the common pad, and an output resistance region coupled in shunt between the output pad and the common pad, said flat attenuation element further comprising at least one more distributed resistance region coupled between said input and output conductive pads and also coupled to said common conductive pad.

4,107,633
BROADBAND MICROWAVE CARD ATTENUATOR

Ronald C. Scaletta, Gaithersburg, Md., assignor to Weinschel Engineering Co., Gaithersburg, Md.

Filed Nov. 24, 1976, Ser. No. 744,897
Int. Cl.[2] H01P 1/22
U.S. Cl. 333—81 A 60 Claims



1. An attenuator comprising:

an elongated insulating card having an inner conductor extending longitudinally along the card, said card having first and second faces,

an elongated tubular outer conductor surrounding said card and said inner conductor, said outer conductor having a conductive inner wall,

said outer conductor defining first and second cavities extending away from said first and second faces respectively with the first cavity being many times the size of the second cavity and with relatively small electric field intensity as compared with that in the second cavity,

said card having at least one side edge extending longitudinally along the card, in contact with the inner wall of the outer conductor and in spaced relation with said inner conductor, and

a resistive layer on one face of said card and extending from at least a portion of the inner conductor to the outer conductor,

said outer conductor and said card comprising means to accurately position the inner conductor with respect to that portion of the inner wall of the outer conductor which is contiguous with said second cavity and to provide the attenuator with a constant characteristic impedance over a band of frequencies extending from D.C. to at least 2 GHz.

4,107,634
DETENT MECHANISM ESPECIALLY FOR MICROWAVE DRUM ATTENUATOR

Ronald C. Scaletta, and George Capek, both of Frederick, Md., assignors to Weinschel Engineering Co., Gaithersburg, Md.

Filed Nov. 24, 1976, Ser. No. 745,037
Int. Cl.[2] H01P 1/22; G05G 5/06
U.S. Cl. 333—81 A 23 Claims

1. Apparatus for biasing a body, mounted for rotation about an axis, in any one of several predetermined angular positions comprising

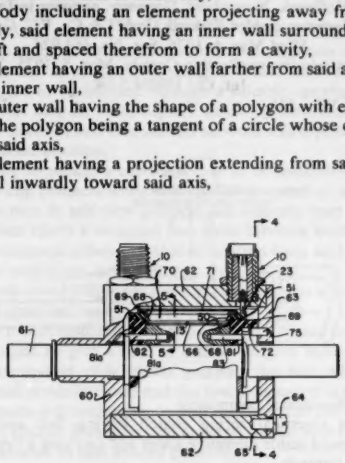
a shaft for said body, said shaft having an axis that corresponds to the axis of said body,

said body including an element projecting away from said body, said element having an inner wall surrounding said shaft and spaced therefrom to form a cavity,

said element having an outer wall farther from said axis than the inner wall,

said outer wall having the shape of a polygon with each side of the polygon being a tangent of a circle whose center is on said axis,

said element having a projection extending from said inner wall inwardly toward said axis,



a stationary stop member extending into said cavity and which engages said projection to limit the angle of rotation of said body,

each side of said polygon being of substantially equal length, and

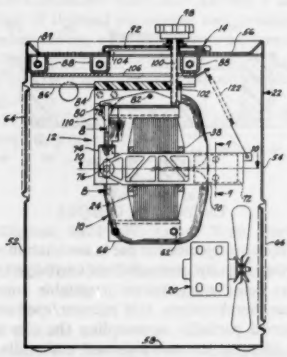
biasing means, comprising a substantially flat surface having a fixed angular position in a plane perpendicular to said axis and which constitutes a tangent to said circle pressing against any one of said sides of said polygon presented to it, for biasing the polygon into any one of several particular angular positions, said last-named means including a resilient element which enables the flat surface to move away from said axis so that the polygon can move from one of its angular positions to the next.

4,107,635

ARC WELDING MACHINE

Richard B. Brundage, Ladue; Walter P. Jost, Jr., Manchester, and Mortimer P. Burroughs, University City, all of Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Dec. 6, 1976, Ser. No. 747,513
Int. Cl.[2] H01F *21/06*
U.S. Cl. 336—45 **10 Claims**



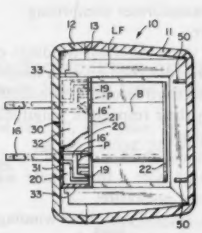
1. In an a.c. arc welder, a transformer having an iron core comprising a flat frame defining a window, primary and secondary coil means wound on said frame, an elongated nonmetallic flux shunting member carrying an iron flux shunting core at one end thereof extending through said window perpendicular to said frame, said elongated member being freely slidable longitudinally between two opposed surface portions of said frame extending in parallel through said window when said member is substantially perpendicular to said frame, but being firmly locked against movement when forcibly tilted so as to bind between said surface portions, an elongated fixed guide spaced laterally from said window and extending perpendicular to said flat frame, a slidably mounted member constrained to slidable movement in said guide, means connecting said slidably mounted member to one end of said flux shunting member including force multiplying means operation to forcibly tilt said flux shunting member to a locked position when moved in one direction and operative to release it when moved oppositely, and a handle connected to said slidably mounted member for moving said flux shunting member longitudinally in said window.

4,107,636

PLUG-IN ADAPTOR

John DiGirolamo, Orange, N.J., assignor to Jerome Industries Corporation, Orange, N.J.

Filed May 20, 1977, Ser. No. 798,971
Int. Cl.[2] H01F *15/10, 27/04*
U.S. Cl. 336—92 **4 Claims**

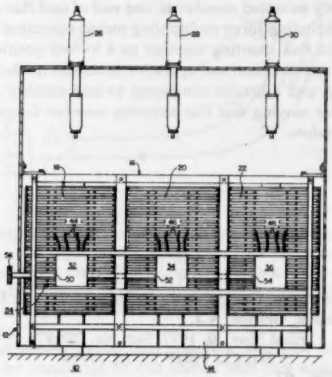


1. A power pack including a bobbin having spaced apart parallel flanges extending from a spindle, magnetic transformer means extending about said bobbin and through said spindle in planes parallel to said spindle, primary wall blades extending from said bobbin in planes parallel to said transformer means, and perpendicular to said flanges, an outer casing for said bobbin and transformer means and having slots to accommodate said primary wall blades and boss means adjacent rearward portions of said transformer means for holding said transformer means and bobbin against relative upward and downward movement, a shelf fabricated integrally with one of said flanges and extending substantially perpendicularly thereto and outwardly above said transformer means, channel means integrally formed in said shelf, said primary wall blades having inner ends constituting with said channels cooperating means for retaining said ends within said channels, a separate cover fitted over and covering said inner ends of said blades and said shelf, said cover having a front wall formed with slots fitted around said blades, a top and sides fitted over and on either side of said shelf and an apron extending continuously from said front wall in front of said tranformer means and below said blades, said cover constituting means for insulating and for further retaining said blade inner ends, said cover and said transformer means being fitted within said casing with said apron press fit between said casing and said transformer means to constitute with said boss means and said casing slots the only means for retaining the relative positions of said casing, said bobbin and transformer means and said cover.

4,107,637
NO-LOAD TAP CHANGER FOR THREE-PHASE TRANSFORMERS

Edward F. Guidosh, Hubbard, Ohio, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 27, 1977, Ser. No. 763,208
Int. Cl.[2] H01F *21/12;* H01H *3/00*
U.S. Cl. 336—150 7 Claims

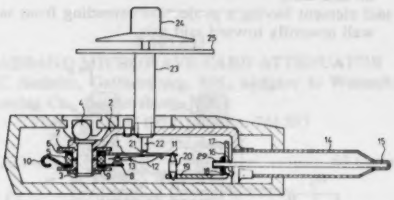


1. An electrical transformer comprising:
a sealed enclosure;
first, second and third electrical windings each formed of a plurality of turns disposed about a longitudinal axis, said first, second and third electrical windings disposed in said enclosure with their respective longitudinal axes aligned in a common plane;
said first, second and third electrical windings disposed in inductive relation with a three-phase magnetic core disposed within said enclosure;
each of said first, second and third windings having tapped winding sections with tap leads connected thereto;
insulating means having generally planar exterior surfaces; said insulating means disposed in said enclosure with said planar surfaces substantially parallel to said common plane and spaced laterally from and within the axial extent of said first, second and third windings;
first, second and third contact sets affixed to said insulating means, each of said contact sets containing a plurality of stationary contacts arranged in an arcuate pattern and equidistant from an axis of rotation; said stationary contacts connected to respective tap leads of said first, second and third windings;
first, second and third movable contacts pivotally mounted on said insulating means and adapted for making electrical connection with respective stationary contacts of said first, second and third contact sets;
first, second and third drive means; said first, second and third drive means having said first, second and third movable contacts, affixed thereto, respectively; said first, second and third drive means operative to rotate said first, second and third movable contacts, respectively, through sequential engagement with successive stationary contacts of said first, second and third contact sets;
operating means mounted outside of said enclosure; and
first, second and third connecting means, operative to couple said first, second and third drive means to said operating means such that movement of said operating means causes simultaneous movement of said first, second and third drive means.

4,107,638
THERMOSTAT

Walter Hollweck, Nuremberg, Germany, assignor to Inter Control Hermann Kohler Elektrik GmbH & Co. KG, Germany

Filed Mar. 4, 1976, Ser. No. 664,024
Claims priority, application Canada, Mar. 5, 1975, 221294
Int. Cl.[2] H01H *5/04*
U.S. Cl. 337—131 13 Claims

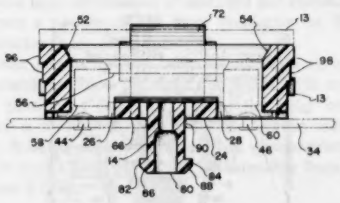


1. A thermostat comprising:
(a) an electrical spring switch having first and second stressed stable operative states and carrying a first electrical contact;
(b) support means for retaining said switch at one end thereof;
(c) a second electrical contact mounted on said support means in opposition to said first electrical contact;
(d) a heat probe rod axially movable with change in temperature with respect to said support means; and
(e) a lever, the end of said heat probe rod being linked to one leg of the lever, the fulcrum of the lever being closer to the probe rod than to the end of the other leg of the lever, and the end of said other leg of the lever being linked to the other end of the switch opposite said one end thereof whereby movement of said lever by said heat probe rod are transmitted to said other end of said switch to motivate said switch between said first and second stressed stable operative states.

4,107,639
CARTRIDGE FUSE INJECTOR AND EJECTOR

Ralph M. Levy, Abington, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 10, 1976, Ser. No. 656,886
Int. Cl.[2] H01H *85/22*
U.S. Cl. 337—205 13 Claims



1. A fuse injector/ejector for use in association with a pair of spaced apart spring clip contacts for a cartridge type fuse, said clip contacts being mounted on a suitable support base to receive a fuse therebetween, said injector/ejector comprising:
a fuse shroud partially surrounding the clip contacts and having an open top and side and end walls of sufficient height to be at least coextensive with the spring clip contacts;
said fuse shroud further having a bottom wall with a pair of spaced apart openings adapted to receive said clip contacts and an interior bottom wall surface between said

clip contacts arranged to be adjacent to a fuse mounted in said clip contacts;

a mounting pedestal attached to an exterior bottom wall surface and extending outwardly in a direction opposite from the direction of extension of said side walls and adapted to be inserted through a suitable opening in the support base for loose captive mounting therein to permit movement of said fuse shroud between a first position and a second position;

whereby to permit a cartridge fuse to be inserted between said clip contacts when said shroud is seated on said support base in said first position and whereby said interior surface ejects a mounted fuse from between both of said clip contacts when said shroud is lifted from said support base to said second position;

a shroud cover means arranged to cover at least a portion of said open top; and

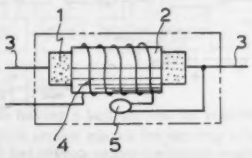
a claw means mounted on an inside surface of said cover and arranged to grip a fuse to a lesser degree than the clip contacts, said claw means gripping the fuse when said shroud cover is closed and the fuse is mounted in said clip contacts and continuing to grip the fuse after the fuse has been ejected from said clip contacts by the movement of the shroud to said second position.

4,107,640

CURRENT LIMITING ELEMENT FOR PREVENTING ELECTRICAL OVERCURRENT

Chihiro Asano, Kakamigahara; Shigeyuki Hikita, and Kunio Kato, both of Nagoya, all of Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho

Filed Nov. 19, 1976, Ser. No. 743,322
Claims priority, application Japan, Nov. 19, 1975, 50-139007
Int. Cl.[2] H01C *7/13, 7/02*
U.S. Cl. 338—23 **7 Claims**



1. A current limiting element comprising:

a principal current conducting member made from a low resistance conductive elastomer having a high positive coefficient of thermal expansion, said principal conducting member having a flattened cross-sectional shape;

a heating/heat insulating member having a high resistance surrounding the circumference of said conducting member; and

an indirect heating element disposed adjacent said heating-/heat insulating member.

4,107,641

LIQUID RHEOSTAT

George M. Osgood, 4474 SW. Arthur Way, Portland, Oreg. 97201

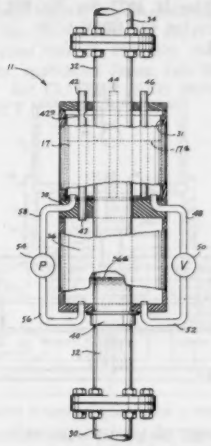
Filed Jun. 24, 1976, Ser. No. 699,614
Int. Cl.[2] H01C *1/082*
U.S. Cl. 338—55 **11 Claims**

1. A liquid rheostat comprising:

reservoir means for holding an electrolyte solution;

a plurality of spaced-apart, elongate electrodes disposed in said reservoir means, said electrodes having lengths adapted to be selectively submerged in the solution; and

electroconductive means disposed in said reservoir means spaced from and substantially surrounding said electrodes at least about the electrode lengths adapted to be selectively submerged, said electrodconductive means also adapted to be selectively submerged in the solution for



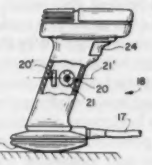
providing a portion of path along which current may be conducted between submerged electrodes.

4,107,642

POTENTIOMETER JOYSTICK

James G. Crummett, San Jose, Calif., assignor to Atari, Inc., Sunnyvale, Calif.

Filed Feb. 14, 1977, Ser. No. 768,280
Int. Cl.[2] H01C *10/16*
U.S. Cl. 338—128 **1 Claim**



1. An inclination sensitive type joystick, comprising:

(a) a handle controllable by an operator of the joystick, said handle having a convex tilting surface for engaging substantially horizontal surfaces during operation;

(b) a first inclination sensitive potentiometer mounted within said handle and having an electrically conductive fluid wiper, an elongate resistance element in wiping relation to the wiper, said fluid and resistance element being located within the potentiometer, and electrical leads operatively connected to the fluid and the resistance element to form a potentiometer circuit;

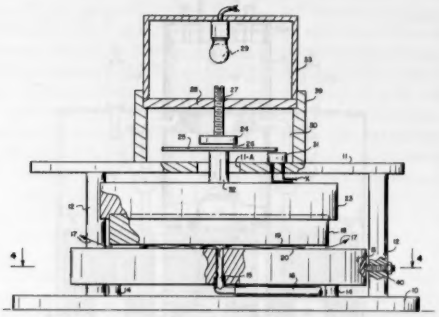
(c) a second inclination sensitive potentiometer mounted within said handle and having an electrically conductive fluid wiper, an elongate resistance element in wiping relation to the wiper, said fluid and resistance element being located within the potentiometer, and electrical leads operatively connected to the fluid and the resistance element to form a potentiometer circuit; and

(d) means for attaching said first and second potentiometers to said handle so that displacement of the handle is resolved into corresponding output resistance values.

4,107,643
UNIDIRECTIONAL HORIZONTAL SEISMOMETER

William A. Rhodes, 4421 N. 13th Pl., Phoenix, Ariz. 85014

Filed May 31, 1977, Ser. No. 802,268
Int. Cl.[2] G01V 1/16
U.S. Cl. 340—17 R 3 Claims



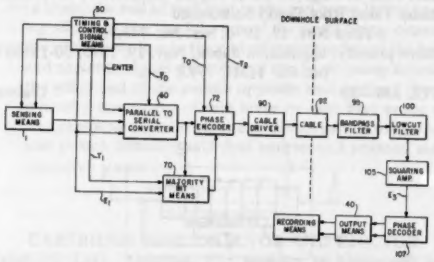
1. A unidirectional horizontal seismometer comprising: a horizontal stationary support with leveling means; first and second discs; said first disc having a concave surface; said second disc having a convex surface of equal and opposite curvature in relation to said first disc; said first disc being horizontally coupled with said stationary support; fluid admittance means communicating with the concave surface of said first disc; the convex surface of said second disc directed downwardly in contact with the concave surface of said first disc, whereby when a fluid is injected between said discs through said fluid admittance means, said second disc is levitated upon a film of fluid therebetween thus permitting the force of gravity to cause said second disc to seek a central concentric relationship with said first disc; the convex surface of said second disc as coupled by said fluid film to said first disc surface facing vertically upward causing the center of radius of curvature to exist in space above said curvature, whereupon fluid levitated said second disc when horizontally displaced relative to said first disc, assumes a natural period of oscillation similar to a pendulum of substantially the same radius of curvature; said oscillations being responsive to earth movements in opposition to said second disc movement through said stationary support, from any horizontally arriving earth tremor thereunder and from any horizontal direction; said response thereby causing horizontal positional changes of said first disc relative to said second disc; and means for transducing signals from such differential relative positions into an appropriate recording system; the radius of said curvature chosen for both said discs providing oscillations similar to those of a pendulum oscillating from the center of the curvature of said discs and thereabove within the spectral range of natural frequencies created by earthquakes; and further choice of special bands of frequency period response within the total range depending upon said radius of curvature periods being amendable to change toward longer periods as said fluid film is increased, thus causing wider separation between both said surfaces; and a means for damping out free oscillations of said second disc.

4,107,644
SYSTEM AND METHOD FOR DIGITALLY TRANSMITTING WELL LOGGING INFORMATION

Donald L. Howlett, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Dec. 15, 1976, Ser. No. 750,746
Int. Cl.[2] G01V 1/40
U.S. Cl. 340—18 CM 4 Claims

1. A well logging system comprising a logging tool adapted to be passed through a borehole traversing an earth formation including sensing means for sensing at least one condition of the earth formation and providing parallel digital signals corresponding to the sensed condition; converter means connected to sensing means for providing a serial digital signal wherein predetermined number of bits comprise digital words, some digital words are information words and correspond to the parallel digital signals while other digital words correspond to predetermined mined sync words; timing signal means connected to the converter means for providing timing pulses to the converter means so as to cause the converter means to provide the digital information words in a fixed predetermined relationship to the digital sync words, said timing signal means includes timing pulse means for repetitiously providing timing pulses T_0, T_1, T_2 and T_3 constituting a bit cycle, means connected to the timing pulse means for utilizing one of the timing pulses during each cycle to generate shift pulses and for providing the shift pulses to the converter means, first bit counter means connected to the timing pulse means for counting one of the timing pulses in each bit cycle of a bit pulse and providing a word pulse when the number of counter bit pulses equals a predetermined number which constitutes a digital word, first word counter means connected to the bit counter means for counting the word pulses and providing first and second pulses when the number of counted word pulses is equal to a predetermined number of digital words, and logic means connected to the timing pulse means, to the first bit counter and to the first word counter for providing an enter pulse and a reset pulse to the converter means in according with the timing pulses, other than the timing pulses used to generate the shift pulses, the word pulse and one of the pulses from the first word counter



means; and phase encoding means connected to the converter means and to the timing signal means for phase encoding the serial digital signal in accordance with the timing pulses to provide a phase encoded signal, said phase encoder means includes a NOR gate connected to the converter and to the majority bit means for passing the digital data word or the majority bit, first and second NAND gates, said first NAND gate being connected to the NOR gate and receiving timing pulses T_2 and passed pulses from said NOR gate for passing timing pulse T_2 when enabled by a passed pulse from the NOR gate and for blocking the timing pulses T_2 when disabled by the absence of a passed pulse from the NOR gate, an inverter connected to the NOR gate for inverting the output of the NOR gate, said second NAND gate being connected to the inverter and receiving timing pulses T_2 for passing a T_2 time pulse when enabled by output from the inverter and for blocking the timing pulses T_2 when disabled by the output from the inverter, flip-flop means having a clear input, a preset input connected to the first and second NAND gates, respectively; and 'D' input connected to the NOR gate and a 'C' input receiving timing pulses T_0 for providing an output as the phase encoded signal in accordance with the presence or absence of passed pulses from the NOR gate, both NAND gates and timing pulses T_0; cable means for conducting electrical signals from the logging tool to surface equipment, and the logging tool also includes means connected to the phase encoder means for applying the phased encoded signal to the cable; and surface equipment includes filter means connected to the cable for filtering the phased encoded signal to compensate for distor-

tion to the phase encoded signal caused by the cable to provide a filter signal, phase decoder means connected to the filtering means for phase decoding the filter signal to provide a second serial digital signal, corresponding to the first serial digital signal and to provide timing pulses, and output means connected to the phase decoder means for providing parallel digital signals representative of the information words and the sync words in accordance with the second serial digital signal.

4,107,645

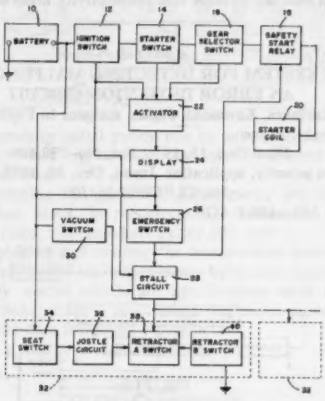
SEAT BELT SYSTEM WITH STARTER ENGINE LOCK AND ALARM

Donald J. Lewis, Troy, and Albert J. Jankowski, Royal Oak, both of Mich., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 208,173, Dec. 15, 1971, abandoned. This application May 22, 1972, Ser. No. 255,740

Int. Cl.[2] B60R *21/10*

U.S. Cl. 340—52 E **12 Claims**



1. In a vehicle having a belt section for restraining an occupant in a seat, first sensor means for sensing whether the belt section has a protracted or retracted condition; second sensor means for sensing whether or not the seat is occupied; a starter motor; circuit means for receiving the outputs of both said first and second sensor means and for inhibiting the energization of said starter motor under conditions of said first and second sensor means other than conditions indicating that the seat has first been occupied and then said belt section has been placed in a protracted condition; and means for sensing a stall of the engine and for allowing the engine to be started one time independently of the condition of the sensing means following a stall;

said means for sensing the stall of the engine and for allowing the engine to be started one time independently of the condition of the sensing means including a switch having a first state wherein said circuit means for receiving the output of said first and second sensor means and for inhibiting the energization of said starter motor under conditions other than those indicating that the seat has first been occupied and then the belt section has been placed in a protracted condition is operative, and a second state wherein said circuit means is inoperative, said switch means being connected to the ignition switch of said vehicle and to a third sensor means operative to provide a signal when the engine stops running after the ignition switch has been closed and being normally in its first state and switched to its second state upon receipt of the signal from said third sensor means.

4,107,646

CENTRALIZED WARNING SYSTEM FOR VEHICLE

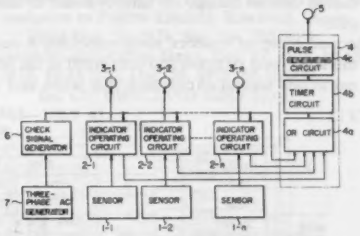
Hiroshi Arai, Toyota, and Koichi Taniguchi, Kariya, both of Japan, assignors to Nippondenso Co., Ltd. and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Continuation of Ser. No. 489,723, Jul. 18, 1974, abandoned. This application Mar. 28, 1977, Ser. No. 781,865

Claims priority, application Japan, Feb. 28, 1973, 48-85083

Int. Cl.[2] G08B *19/00, 29/00*

U.S. Cl. 340—52 F **31 Claims**



1. A centralized warning system for a vehicle comprising:

(1) a plurality of sensors each for detecting a vehicle operating fault at one of a plurality of check points of said vehicle and generating a corresponding electric output signal;

(2) a plurality of indicators provided respectively corresponding to each of said plurality of sensors;

(3) a plurality of indicator operating circuits connected to the respective indicators and sensors, each of said operating circuits generating, in accordance with the output signal of each sensor, an output signal for causing a corresponding one of said indicators to indicate the presence of a fault in the corresponding check point;

(4) a logical circuit connected to each of said operating circuits for generating a logical output in response to the output signal from that indicator operating circuit;

(5) a timer circuit connected to said logical circuit for generating a timing signal of a fixed time duration upon receipt of said logical output of said logical circuit; and

(6) a master warning device operatively connected to said timer circuit for producing a warning signal in response to said timing signal and for automatically ceasing production of said warning signal at the end of said fixed time duration even when a sensor continues to produce said output signal after said fixed time duration.

4,107,647

DECELERATION INDICATING SYSTEM

Muneki Yoshino, Toyokawa, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Apr. 12, 1976, Ser. No. 675,751

Claims priority, application Japan, Apr. 14, 1975, 50-45686; Apr. 16, 1975, 50-51600[U]; May 13, 1975, 50-57139; May 16, 1975, 50-59101; May 28, 1975, 50-72444[U]; Jun. 4, 1975, 50-68049; Jun. 24, 1975, 50-87358[U]; Jun. 4, 1975, 50-68050; Jun. 18, 1975, 50-74957; Jun. 23, 1975, 50-77213; Jul. 31, 1975, 50-93865; Aug. 6, 1975, 50-96239; Jan. 8, 1976, 51-1890

Int. Cl.[2] B60Q *1/26*

U.S. Cl. 340—71 **4 Claims**

1. A deceleration indicating system for a motor vehicle comprising:

a power source mounted in a motor vehicle;

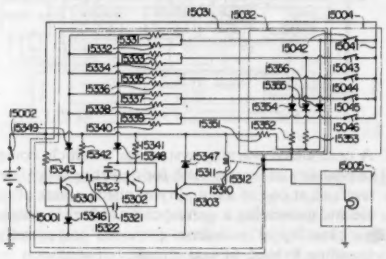
a deceleration indicating lamp provided on the rear end of said motor vehicle;

first means for producing a deceleration signal in response to the degree of deceleration of said vehicle, said first means including a plurality of contact switches respectively operative in response to respective predetermined degrees of the vehicle deceleration, each of said contact switches being connected at one end with said power source;

an oscillator for producing an ON-OFF signal, said oscillator including a first circuit for controlling the ON period of said ON-OFF signal in accordance with the time constant of said first circuit and a second circuit for controlling the OFF period of said ON-OFF signal in accordance with the time constant of said second circuit;

a first group of resistors, each connected at one terminal thereof to a respective one of said switches and connected at the other terminal to said first circuit such that when said respective switches are operated the resistors connected thereto change the time constant of said first circuit;

a second group of resistors, each connected at one terminal thereof to said switches and connected at the other terminal to said second circuit such that when said respective



switches are operated the resistors connected thereto change the time constant of said second circuit;

second means connected to said oscillator, for selectively applying a current to said deceleration indicating lamp to switch said lamp ON and OFF in accordance with said ON-OFF signal;

a third group of resistors, each connected at one terminal thereof to a respective one of said switches and connected at the other terminal to said second means such that when said respective switches are operated the resistor connected thereto changes the current supplied to said lamp; and

whereby the brightness of said lamp and the frequency of the lighting of said lamp are simultaneously varied in accordance with the degree of the deceleration of said motor vehicle.

4,107,648

SCAN ENCODING OF TWO DIMENSIONAL PICTORIAL ENTITIES

Amalie Julianna Frank, Chatham Township, Morris County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 12, 1976, Ser. No. 675,926
Int. Cl.[2] G06K *9/12*
U.S. Cl. 340—146.3 H **8 Claims**

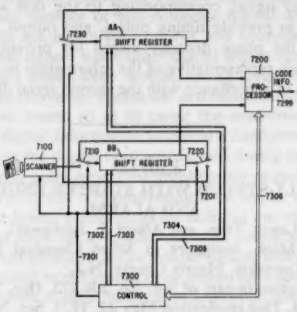
1. Apparatus for encoding two dimensional blobs defined by a plurality of runs from a sequence of consecutive scans, which runs meet the connectivity criteria that runs of consecutive scans have run-beginnings and run-endings that are no more than J pels apart and that only one run in a scan connect to the same run in a preceding scan, comprising:

means for placing each scan in a first register and its immediately preceding scan in a second register;

means for shifting the contents of both said registers and applying to their output signals said connectivity criteria;

means for assigning a connect code to runs in said first register for which such connectivity criteria are met; and

means for assigning a head code to runs in said first regis-



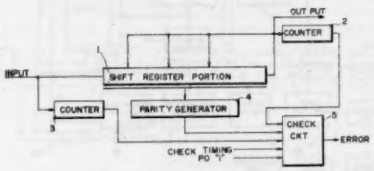
ter and a tail code to runs in said second register for those runs that fail to meet said connectivity criteria.

4,107,649

CHECK SYSTEM FOR DETECTING MALFUNCTION OF AN ERROR DETECTION CIRCUIT

Yasuo Kurihara, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 15, 1976, Ser. No. 750,649
Claims priority, application Japan, Dec. 30, 1975, 50-158119
Int. Cl.[2] G06F *11/10*
U.S. Cl. 340—146.1 AG **14 Claims**



1. An error detection circuit checking system for checking error detection within a data processing circuit, said system receiving input data and having a data storing state for storing said input data and an output stage for providing said stored data as output data, comprising:

an error detection circuit of said data processing circuit, the error detection circuit having a parity generator for deriving a parity signal;

a predictive parity signal generator comprising means for counting the numbers of a predetermined logic value in the input data of the data processing circuit, and means for counting the numbers of said predetermined logic value in said output data of the data processing circuit; and

means for comparing the parity signal derived by the parity generator with the predictive parity signal from the predictive parity signal generator to detect malfunction of the error detection circuit.

4,107,650

ERROR CORRECTION ENCODER AND DECODER

Perry J. Luke, Silver Spring; James L. Machamer, Baltimore, and William A. Becraft, Silver Spring, all of Md., assignors to The Johns Hopkins University, Baltimore, Md.

Filed Aug. 13, 1976, Ser. No. 714,330
Int. Cl.[2] G06F *7/12*
U.S. Cl. 340—146.1 AL **33 Claims**

1. A method for correcting errors introduced during the recording of data bits onto and reproduction of data bits from

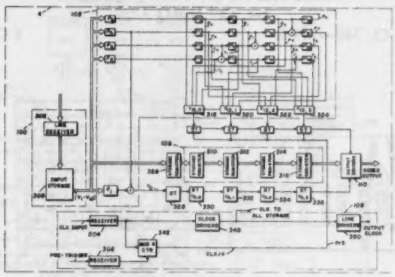
a plurality of parallel data tracks on a magnetic storage medium, comprising the steps of:

encoding data prior to recording, which comprises the steps of:

entering characters of data, comprising a data bit from each track, into an encoder,

formatting the entered data into a data block, said data block being defined as k *m*-bit bytes wherein the data block comprises a byte along each of *k* data tracks, where "*m*" and "*k*" are integers,

generating at least one *m*-bit output parity byte corresponding to each data block comprising the steps of:



generating initial parity bits by selectively combining the data bits as each character is entered into the encoder,

combining the generated initial parity bits for every data block, in predetermined fashion, in order to produce intermediate parity bits, and

combining and reading the intermediate parity bits to produce *m*-bit output parity bytes onto separate parity tracks which are synchronous with the data tracks, and a

decoding the data following reproduction.

4,107,651

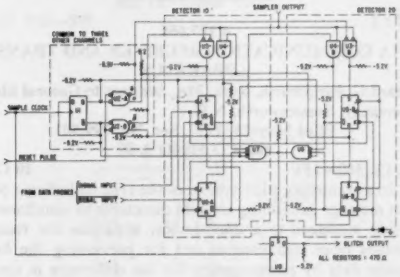
GLITCH DETECTOR

William Donald Martin, Colorado Springs, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 8, 1976, Ser. No. 740,266

Int. Cl.[2] H01J *29/52*; G06F *11/00*

U.S. Cl. 340—146.1 R **3 Claims**



1. A circuit for detecting glitches on a digital signal comprising:

sampling means, coupled to receive the digital signal and having an output, for recurringly sampling the digital signal; and

detection means, coupled to receive the digital signal and coupled to the output of said sampling means and having an output, for detecting a positive transition upon the digital signal during the interval between sequential samples sequent to sampling of a high level signal on the digital signal, for detecting a negative transition upon the digital signal during the interval between sequential samples sequent to sampling a low level signal on the digital signal, and for providing a signal upon the output responsive to the detection of such transitions.

4,107,652

ERROR CORRECTING AND CONTROLLING SYSTEM

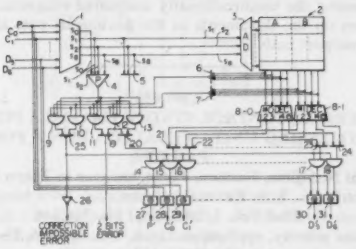
Jun'ichi Tanahashi, Yamato, and Takashi Kanie, Tama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 23, 1976, Ser. No. 753,786

Claims priority, application Japan, Dec. 27, 1975, 50-157516; Dec. 29, 1975, 50-157727; Dec. 30, 1975, 50-156829

Int. Cl.[2] G08C *25/00*; G06F *11/12*

U.S. Cl. 340—146.1 AL **12 Claims**



1. In an error correcting and controlling system in which an error check bit for correcting random *t*-bit errors ($t \geqq 2$) and detecting $(t+1)$-bit errors is added to data, and in utilizing said data, *t*-bit errors are automatically corrected based on said data and said added error check bit and $(t+1)$-bit errors are similarly detected, said error correcting and controlling system comprises:

syndrome generating means for generating syndrome outputs of said data,

a memory for storing encoded error bit position information at address positions corresponding one-to-one to a portion only of the outputs of said syndrome generating means,

addressing means responsive to said syndrome outputs of said syndrome generating means for addressing said memory to read out said bit position information corresponding to said syndrome outputs, and

processing means for processing said syndrome outputs and said encoded error bit position information read out from said memory so as to decode the latter, to identify errors in said data, and to modify said data, whereby detection and correction of errors of said data are performed based on the stored contents of said memory.

4,107,653

DOCUMENT PROCESSING, MAGNETIC CHARACTER DETECTING APPARATUS

Karlis Kruklitis, Plymouth, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed May 23, 1977, Ser. No. 799,243

Int. Cl.[2] G06K *9/00*

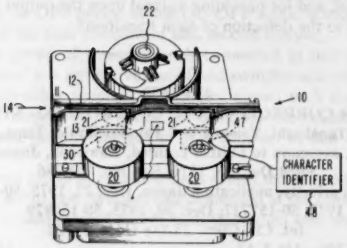
U.S. Cl. 340—146.3 C **10 Claims**

1. A method of detecting magnetic characters on documents where the dipoles of the magnetic characters may not be unidirectionally orientated, comprising:

moving documents serially along a document transport path;

orientating the magnetic dipoles of the characters on the documents in one direction by passing the documents between two magnets, one located on each side of the document transport path, with such magnets having like

unidirectional magnetic poles facing toward each other; and



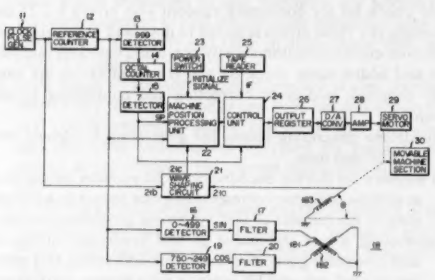
detecting the unidirectionally orientated magnetic characters on the documents as the documents pass along the transport path.

4,107,654

NUMERICAL CONTROL SYSTEM HAVING A POSITION PROCESSING UNIT OPERATED UPON A POWER FAILURE

Tadashi Nishijima, Hamura, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Feb. 7, 1977, Ser. No. 766,346
Claims priority, application Japan, Feb. 6, 1976, 51-12006
Int. Cl.[2] G05B *13/02, 19/18*
U.S. Cl. 340—147 MT **9 Claims**



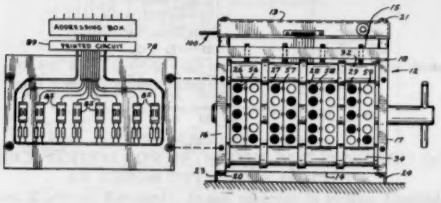
1. A numerical control system having a position processing unit operated upon a power failure, comprising a tape reader for inputting a numerical data for instructing an action of a machine tool; control means for receiving an instruction data from the tape reader and a data corresponding to the present position of the machine tool and calculating an amount of movement to be made by the machine tool for each predetermined time period; means for driving the machine tool based on an output from the control means which corresponds to the amount of movement of the machine tool; detection means for detecting the position of a movable section of the machine tool; and machine tool position processing means comprised of a position counter for counting based on a scale of 1000 notation a data corresponding to the absolute position of the machine tool which is detected at said detection means, a machine tool position calculating section for calculating based on a binary notation the present position of the machine tool for each said predetermined time period, a position register for storing a data from said machine tool position calculating section which corresponds to the present position of the machine tool and for supplying said data to said control means, a permanent storage type memory for storing and holding a data corresponding to absolute position of the machine tool counted at said position counter for each said predetermined time period even at the power interruption time, a position correction section for delivering at the power recovery time an output corresponding to the corrected actual position of the machine tool as obtained by correcting the over-travel effected by the machine tool at the power interruption time, and a gate circuit section for controlling a correction operation for presetting into said position register an output data corresponding to the corrected present position of the machine tool as obtained from said position correction section.

4,107,655

MECHANICAL CODE FOR OPERATED DEVICE FOR ACCESS TO CODED ELECTRICAL CIRCUITS

John H. Moorhouse, Clear Lake, Minn. 55319

Filed Jan. 10, 1977, Ser. No. 758,059
Int. Cl.[2] H04Q *3/00*
U.S. Cl. 340—149 R **6 Claims**



1. A mechanical code operated device and code sensing means, having in combination

a plurality of concentric cylindrical rotatable tumblers having relative rotation,

means supporting said tumblers,

said tumblers having aligned bores defining a keyway,

said tumblers each bearing code indicia on their respective edge portions,

code indicia sensing means carried by said first mentioned means sensing said code indicia aligned therewith,

said code indicia comprising reflective spots, some of said spots being more reflective than other of said spots,

means limiting relative rotation of said tumblers for alignment of said indicia, and

a code bearing operating means engaging said tumblers rotating the same relative to each other to indicate with said indicia a code corresponding to the code represented by said code bearing operating means, said code indicia being aligned with said code indicia sensing means.

4,107,656

DATA COMMUNICATION RECEIVER AND TRANSFER APPARATUS

Richard G. Farnsworth, York, Me., assignor to General Electric Company, Somersworth, N.H.

Filed May 23, 1977, Ser. No. 799,581
Int. Cl.[2] H04Q *3/00*
U.S. Cl. 340—151 **10 Claims**

1. In a communication system of the type including a plurality of message generating sources directable to simultaneously provide messages to a user device, apparatus for receiving messages from said sources and for preventing the loss of message data by compensating for the difference in time between the arrival of the earliest and the latest received messages due to inherent message delays in the system and for effecting the simultaneous transfer of the received messages to said user device, said apparatus comprising;

(a) a plurality of receivers, each in communication with at least one of said message generating sources, each of said receivers including,

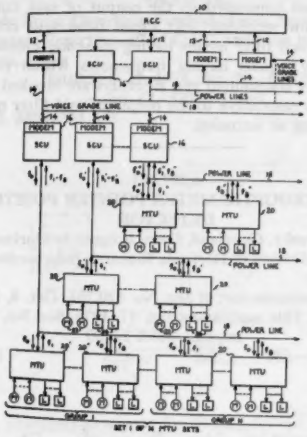
(1) means for generating a clock signal in response to a received message,

(2) means for storing the received message in response to said clock signal;

(b) means common to said plurality of receivers including,

(1) means responsive to the clock signal from each of said receivers for generating an output pulse corresponding to only the clock signal generated by the receiver to receive the earliest arrived message,

(2) delay means responsive to said output pulse for generating a delay pulse at a prescribed interval of time after said output pulse, said interval of time being of sufficient



duration to allow the latest arrived message to be received by the receiver receiving the latest message,

(3) means enabled by said delay pulse to generate a transfer signal; and

(c) means coupled to the means for storing in each of said receivers and responsive to said transfer signal to effect the simultaneous transfer of the stored message from each receiver to said user device.

4,107,657

FLAME DETECTING APPARATUS

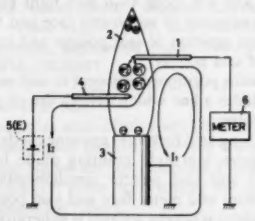
Susumu Nisbigaki, and Akio Ohgoshi, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 629,330, Nov. 6, 1975, abandoned. This application Dec. 17, 1976, Ser. No. 751,747

Claims priority, application Japan, Nov. 14, 1974, 49-131375

Int. Cl.[2] G08B *17/12*

U.S. Cl. 340—579 **1 Claim**



1. A method of detecting the presence or absence of a flame at a flame position, said method comprising disposing a first electrode in said flame, said first electrode including a metal having a work function of less than 3 eV, disposing a second electrode in said flame at a level lower than said first electrode, biasing said second electrode with a negative direct current voltage, said first electrode having a direct current potential higher than said second electrode, and deriving a signal from said first electrode, which signal indicates whether a flame is present or not.

4,107,658

LIQUID LEVEL DETECTOR CIRCUITS

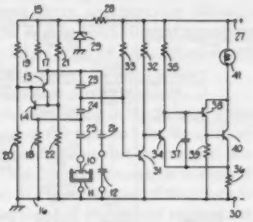
William Frank Hill, Stafford, and Thomas Nicol, Lichfield, both of England, assignors to Lucas Electrical Limited, Birmingham, United Kingdom

Filed Apr. 13, 1976, Ser. No. 676,608

Claims priority, application United Kingdom, Apr. 19, 1975, 16262/75

Int. Cl.[2] G08B *21/00*

U.S. Cl. 340—620 **6 Claims**



1. A liquid level detector circuit comprising:

first and second supply terminals for connection to opposite respective terminals of d.c. supply;

capacitive probe means having first and second terminals, said first terminal being connected to said first supply terminal;

reference capacitor means having first and second terminals, said first terminal being connected to said first supply terminal;

switch means having two terminals which are connected to the first and second supply terminals respectively and which are connected respectively to the second terminals of said capacitive probe means and said reference capacitor means, said switch means having a first condition in which a current path is established between the terminals of the switch means so that said second terminals of the capacitive probe means and the reference capacitor means are interconnected, and a second condition in which said current path is interrupted so that two different potentials are imposed on the second terminals of the capacitive probe means and the reference capacitor means respectively, whereby there is an excursion of the mean potential on said second terminals of said capacitive probe means and said reference capacitor means when the switch means change from their second condition to their first condition;

means connected to the second terminals of said capacitive probe means and said reference capacitor means to detect the mean potential on said second terminals; and

a warning circuit connected to the detecting means and sensitive to the sense of the excursion of the mean potential on said second terminals when said switch means change from their second condition to their first condition.

4,107,659

INTRUSION ALARM SYSTEM WITH IMPROVED AIR TURBULENCE COMPENSATION

Donald P. Massa, 280 Lincoln St., Hingham, Mass. 02043, assignor to Fred M. Dellorfano, Jr. and Donald P. Massa, both of Cohasset, Mass., Trustees of The Stoneleigh Trust

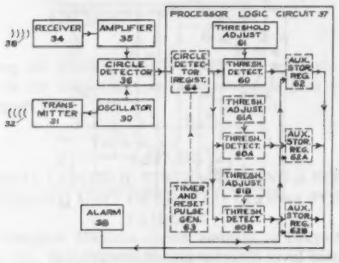
Filed May 5, 1976, Ser. No. 683,548

Int. Cl.[2] G08B *13/16*

U.S. Cl. 340—552 **18 Claims**

1. In an intrusion alarm system, means for radiating a signal

at a predetermined frequency into space, means for receiving the signal as it is reflected from a plurality of objects within the space, said received signal characterized in that it may be represented by a rotating phasor, said rotating phasor characterized in that it is the summation of a plurality of individual rotating component phasors, each representing a reflected signal from one of said plurality of objects, said rotating component phasors further characterized in that they represent two groups of reflected signals, a first group reflected from stationary objects, and a second group reflected from moving objects, said first group of reflected signals characterized in that they are represented by rotating component phasors whose average frequency of rotation is equal to the frequency

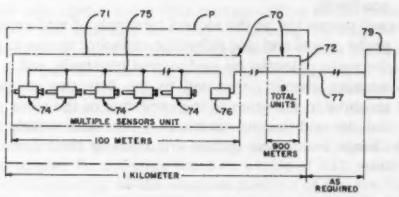


of the transmitted signal, said second group of reflected signals characterized in that they are represented by rotating component phasors whose average frequency of rotation is different from the frequency of the transmitted signal by amounts corresponding to the rates of movements of said objects, said total rotating phasor further characterized in that the locus of the head of said total rotating phasor describes a quasi-circular path relative to the head of the summation of said first group of rotating component phasors, signal processing means for processing said received signal, said signal processing means including a circle detector for recognizing the presence of said quasi-circular paths in said total rotating phasor when they appear.

4,107,660
INTRUSION DETECTION SYSTEM

Thomas P. Chleboun, San Jose, Calif., assignor to GTE Sylvania Incorporated, Mountain View, Calif.

Filed Nov. 3, 1970, Ser. No. 90,206
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—566 **7 Claims**



1. A subterranean intrusion detection system comprising

an even numbered group of elongated sensors disposed in a single line in end-to-end relation at substantially the same depth below the earth's surface, each sensor being mechanically coupled to the earth for receiving pressure waves therefrom and comprising

a deformable hollow enclosure filled with an incompressible liquid,

a pressure responsive transducer in said liquid capable of converting pressure waves in said liquid into a unidirectional voltage, said transducer having two outputs of opposite polarity,

conductor means electrically connecting the outputs of said transducers in parallel with the polarities of the transducers of adjacent sensors reversed,

comparison means connected to said conductor means for comparing the transducer outputs of one polarity with the transducer outputs of opposite polarity and producing a signal when said outputs differ,

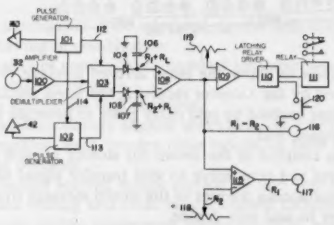
filter means connected to the output of said comparison means for receiving said signal from said comparison means, said filter means having passband characteristics whereby signals having frequencies within prescribed limits are transmitted and all others are blocked,

and means responsive to the output of said filter means for indicating an intrusion.

4,107,661
ELECTROOPTIC METER POINTER POSITION DETECTOR

Robert J. Crosby, Cleveland, Ohio, assignor to Horizons Incorporated a division of Horizons Research Incorporated, Cleveland, Ohio

Continuation-in-part of Ser. No. 620,751, Oct. 8, 1975, abandoned. This application Aug. 17, 1976, Ser. No. 715,068
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—688 **11 Claims**



1. A system adapted to be used in conjunction with a meter having a pointer and which detects the presence or absence of the pointer at some set point of the region normally traversed by the pointer during the operation of the meter, said system being operative independently of the operation of said meter and not affecting the same, said system comprising in combination: a meter including a meter face, a pointer mounted for movement across said meter face and detecting means including means to detect the presence or absence of said pointer at some set point along the path traversed by said pointer as it traverses said meter face, said detecting means comprising:

at least one and not more than two light emitting diodes positioned adjacent to said meter face and to one side of the set point position of said pointer and intermediate of the ends of said pointer;

a phototransistor positioned adjacent to said meter in a plane which includes a line which defines the set point position of said pointer;

means for pulsing said first light emitting diode so as to cause radiation from said light emitting diode to fall on said meter face and said pointer simultaneously and to be reflected from said meter face and said pointer onto said phototransistor whereby a signal is generated indicative of said reflected radiation and hence indicative of the position of said pointer;

wherein the means to pulse said light emitting diode is a buffer amplifier feeding said light emitting diode the information which said phototransistor sees, causing the system to regenerate and oscillate until the reflect light to said phototransistor is obscured by said pointer, at which time the oscillation ceases;

and containing in addition a bootstrap amplifier for the

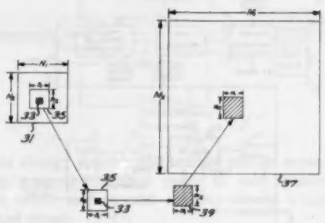
signal generated by said phototransistor whereby the sensing circuit is rendered insensitive to ambient light, but remains capable of seeing said reflected radiation of said light emitting diode.

4,107,662

CHARACTER GENERATOR FOR VISUAL DISPLAY DEVICES

Hirohido Endo, Cupertino; Fumiyuki Inose, San Jose, and Akio Komatsu, Cupertino, all of Calif., assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 17, 1976, Ser. No. 658,390
Int. Cl.[2] G06K *15/20*
U.S. Cl. 340—324 AD **17 Claims**



1. A character generator for display devices, comprising:
memory means for storing character patterns, each pattern being an $N_1 \times N_2$ matrix of binary data bits;
means for reading said $N_1 \times N_2$ matrix out of said memory means, line by line;
means for storing a plurality of the lines of the $N_1 \times N_2$ matrix read from memory in serial fashion, the length of said storing means being sufficient to store at least twice the number of bits required for generating the display bits required for one scan line on the display device;
means for extracting an $n_1 \times n_2$ matrix of binary data bits for each bit stored in said serial storing means; and
means for generating an $m_1 \times m_2$ matrix of binary data bits in response to said $n_1 \times n_2$ matrix, said $m_1 \times m_2$ matrix defining said bit expanded to its display size.

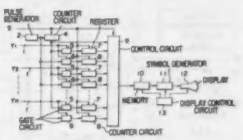
4,107,663

OPERATION STATE DISPLAY APPARATUS

Katsuhide Morimoto; Masaji Matsumura; Nobuharu Yamauchi, all of Amagasaki; Haruo Koyanagi, Musashi-Murayami; Iwao Sato, Komae; Buhei Yasuhara, and Jiro Sakai, both of Tokyo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo and Nissan Motor Company, Limited, both of, Japan

Filed Mar. 5, 1975, Ser. No. 555,597
Claims priority, application Japan, Mar. 26, 1974, 49-34096; Mar. 26, 1974, 49-24097
Int. Cl.[2] G06F *3/14*
U.S. Cl. 340—324 AD **4 Claims**

1. An operation state display apparatus comprising:
a start input signal line for receiving a start signal,
a first input signal line for receiving a first input signal having on and off states representing the operation state of a first controlled object,
a second input signal line for receiving a second input signal having on and off states representing the operation state of a second controlled object,
a pulse generator for generating pulse trains at a predetermined cycle,
a first counter circuit,
a first gate circuit which assumes its on state when the first input signal is in the on state and its off state when the first input signal is in the off state,
a second gate circuit which assumes its on state when the first input signal is in the on state and its off state when the first input signal is in the off state,
a third gate circuit which assumes its on state when the second input signal is in the on state and its off state when the second input signal is in the off state,
a fourth gate circuit which assumes its on state when the second input signal is in the on state and its off state when the second input signal is in the off state,
a first register,
a second register,
a second counter circuit,
a third counter circuit,
a control circuit means,
a memory for storing signals representative of the period of time lapse from an operation initiation reference time when the first or second input signal changes from its off state to its on state or from its on state to its off state,
a symbol generator,
a display control circuit means,
a display for displaying in the form of a time chart the operation state of the first and the second controlled objects,
means connecting the start input signal line to a second input of the first counter circuit, to a second input of the first register, to a second input of the second counter circuit, to a second input of the second register, to a second input of the third counter circuit and to a first input of the control circuit,
means connecting the output of the pulse generator to a first input of the first counter circuit, to a first input of the



second gate circuit and to a first input of the fourth gate circuit,
means connecting the output of the first counter circuit to a second input of the control circuit, to a first input of the first gate circuit and to a first input of the third gate circuit,
means connecting the first input signal line to a second input of the first gate circuit and to a second input of the second gate circuit,
means connecting the second input signal line to a second input of the third gate circuit and to a second input of the fourth gate circuit,
means connecting the output of the first gate circuit to a first input of the first register,
means connecting the output of the second gate circuit to a first input of the second counter circuit,
means connecting the output of the third gate circuit to a first input of the second register,
means connecting the output of the fourth gate circuit to a first input of the third counter circuit,
means connecting the output of the first register to a third input of the control circuit,
means connecting the output of the second counter circuit to a fourth input of the control circuit,
means connecting the output of the second register to a fifth input of the control circuit,
means connecting the output of the third counter circuit to a sixth input of the control circuit,

means connecting the output of the control circuit to a first input of the memory,

means connecting the output of the memory to a first input of the symbol generator,

means connecting the output of the symbol generator to a first input of the display,

means connecting a first output of the display control circuit to a second input of the memory,

means connecting a second output of the display control circuit to a second input of the symbol generator,

means connecting a third output of the display control circuit to a second input of the display,

said control circuit means functioning to supply the memory with the data contained in the first and second registers and the second and third counters at addresses in the memory corresponding to either the first input signal or the second input signal,

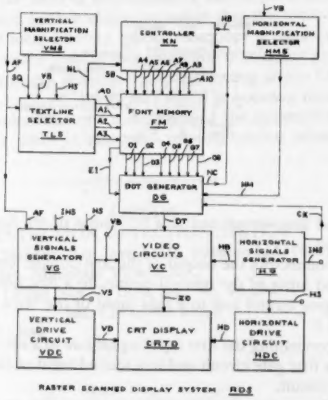
said display control circuit means functioning to cause the memory to deliver periodically data contained therein to the symbol generator, to cause the symbol generator to generate periodically symbols representative of the data supplied thereto by the memory and to cause the display to display the symbols supplied thereto on a continuous basis by the symbol generator to form a time chart showing the operation state of the first and the second controlled objects.

4,107,664

RASTER SCANNED DISPLAY SYSTEM

Francis C. Marino, Dix Hills, N.Y., assignor to Burroughs Corporation, Detroit, Mich.

Filed Jul. 6, 1976, Ser. No. 702,538
Int. Cl.[2] G06K *15/20*
U.S. Cl. 340—324 AD **8 Claims**



RASTER SCANNED DISPLAY SYSTEM RDS

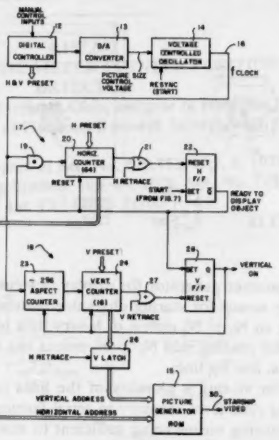
1. In a display system wherein a beam is intensity modulated while scanning a record medium to display graphics and wherein the display system includes means for selectively perform sequential or interlaced scans of parallel display lines, apparatus for controlling the intensity modulation of the beam comprising: storing means for storing indicia associated with matrices of dots representing graphics wherein each row of dots of each matrix is stored in an addressed register of the storing means and the rows of dots of each matrix are stored in sequentially addressed registers; graphic selection means for generating a first portion of an address representing a desired graphic; row selection means for generating a second portion of said address representing a presently desired row of dots of the matrix of the desired graphic; and receiving means for receiving the indicia stored in the register indicated by said row selection means and said graphic selection means for controlling the intensity of the beam in accordance with the pattern of dots represented by said indicia; said row selection means including means for sequentially changing by one unit the second portion of said address for each subsequent display line when a sequential scan is being performed and for sequentially changing by two units the second portion of said address for each subsequent display line when an interlaced scan is being performed.

4,107,665

APPARATUS FOR CONTINUOUS VARIATION OF OBJECT SIZE ON A RASTER TYPE VIDEO SCREEN

Steven T. Mayer, Auburn, and Ronald E. Milner, Grass Valley, both of Calif., assignors to Atari, Inc., Sunnyvale, Calif.

Filed Jun. 23, 1977, Ser. No. 809,314
Int. Cl.[2] G06K *15/20*
U.S. Cl. 340—324 AD **10 Claims**



1. Apparatus for continuous variation of object size on a raster type video screen comprising: control means for determining the movement of said objects on said video screen; variable oscillator means responsive to said control means for generating a signal having a period proportional to the object size as determined by said control means; picture memory means for storing an object having a predetermined number of addressable horizontal lines; counter means driven by said signal from said oscillator means for generating addresses for said picture memory means; vertical latch means for sensing during a horizontal retrace interval of said raster the address contained in said counter means and causing said corresponding addressable line to provide video data on the next horizontal line of said raster whereby if said period is less than the vertical scan rate of said raster said vertical latch means will asychronously cause some addressable lines of said object to be skipped to therefore display a smaller object.

4,107,666

VARIABLE PULSE DISTRIBUTION ELECTRO-OPTICAL SYSTEM

Ernest M. Ward, El Paso, Tex., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 10, 1977, Ser. No. 759,225
Int. Cl.[2] G08B *5/00;* **H05B** *37/00*
U.S. Cl. 340—331 **6 Claims**

1. A variable pulse distribution system for testing radiant energy seekers comprising:

means for providing repetitive trigger pulses;

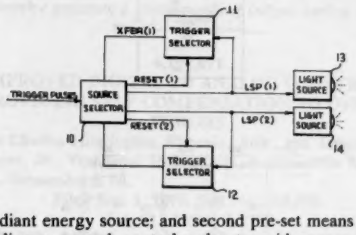
a first radiant energy source for radiating energy when in receipt of a first activation signal;

a second radiant energy source for radiating energy when in receipt of a second activation signal;

controllable source selector means for alternatively supplying said trigger pulses to said first and second radiant energy sources;

first trigger selector means including: a first pulse counter for counting trigger pulses supplied to said first radiant energy source; and first pre-set means for providing a first control pulse to said source selector means when said first counter attains a first pre-selected count; and

second trigger selector means including: a second pulse counter for counting trigger pulses applied to said second



radiant energy source; and second pre-set means for providing a second control pulse to said source selector means when said second counter attains a second pre-selected count;

wherein said first and second pre-selected counts are independently adjustable; and

wherein said source selector means comprises means responsive to said first control pulse for supplying subsequent trigger pulses to said second radiant energy source and responsive to said second control pulse for supplying subsequent trigger pulses to said first radiant energy source.

4,107,667

DUAL SLOPE ANALOG-TO-DIGITAL CONVERTER WITH UNIQUE COUNTING ARRANGEMENT

John W. Kronlage, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 22, 1976, Ser. No. 743,900

Int. Cl.² H03K *13/02, 13/20;* **G01K** *7/00*

U.S. Cl. 340—347 NT **33 Claims**

1. A dual slope analog-to-digital converter comprising:

(a) an integrator circuit having input and output means;

(b) controllable switch means coupled to the input means of said integrator circuit for selectively switching an analog voltage representing a measured parameter and a reference voltage representing the full scale of said measured parameter alternately to the input means of said integrator circuit, said integrator circuit for producing a ramp voltage in one direction when the analog voltage representing the measured parameter is applied to the input means thereof and produces a ramp voltage in the opposite direction when the reference voltage is applied to the input means thereof;

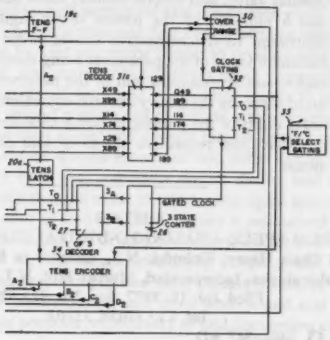
(c) comparator means coupled to the output means of said integrator circuit for producing a logic signal when the integrator ramp voltage crosses a predetermined threshold voltage;

(d) oscillator means for generating a clock pulse signal;

(e) decade counter means having a plurality of binary coded decimal stages coupled to said oscillator means for counting the pulses of said clock pulse signal and for generating a binary coded decimal output signal indicative of said count;

(f) transfer means coupled to said comparator means and to said counter means for transferring the counter value from said counter means each time said logical signal is generated, said transferred counter value being indicative of the binary boded decimal representation of said measured parameter; and

(g) control means coupled to said counter means and to said controllable switch means for controlling said controllable switch means to apply the analog voltage representing



the measured parameter to said integrator means for a first predetermined time period represented by said counter means counting from a first counter value to a second counter value and for applying said reference voltage to

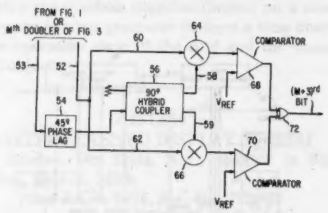
the input means of said integrator circuit for a second predetermined time period represented by said counter means counting from said second counter value to a third counter value, said second counter value being selected so that a plurality of the lowest order digits thereof are equivalent to the respective lowest order digits of the minimum value of the parameter being measured, wherein each count represents a unit of the parameter being measured whereby the binary decimal equivalent of the lowest order digits of the parameter being measured are directly readable from respective stages of said decade counter means.

4,107,668

HIGH-SPEED ANALOG-TO-DIGITAL CONVERTER

Paul Shala Henry, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 15, 1977, Ser. No. 815,820
Int. Cl.[2] H03K *13/02*
U.S. Cl. 340—347 AD **4 Claims**



1. An additional bit generator for use in an analog-to-digital converter arrangement which converts an analog input signal to a multibit digital output signal, the arrangement comprising a phase modulator capable of generating a phase-modulated output signal derived from the modulation, by the analog input signal, of a carrier signal having a frequency which is higher than the highest frequency included in the analog input signal, and means for generating a first and a second bit of the converter multibit digital output signal from the phase relationship between the fundamental harmonic of the phase-modulated output signal and each of a quadrature and in-phase sample of the fundamental harmonic of the carrier signal; the additional bit generator comprising

means for both introducing a 45° phase lag in the carrier signal and generating an output signal representative of the phase lagged signal;

second means for generating a first and a second sample of said phase lag introduction means output signal which samples differ in phase by substantially 90° from each other;

a first and a second phase detector for determining the phase relationship between the output signal from said linear phase modulator and said first and second samples of said phase lag introduction means, respectively;

a first and a second comparator coupled to the output of said first and second phase detector, respectively, and to a predetermined reference potential for comparing the output signal from the associated phase detector with said reference potential, each comparator generating an output signal having a first binary value when the magnitude of the associated phase detector output signal is greater than said reference potential and a second binary value when the magnitude of the associated phase detector output signal is less than said reference potential; and

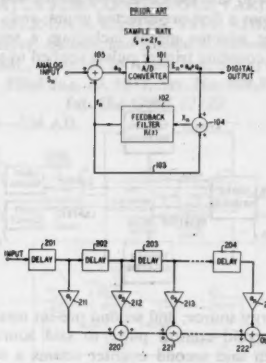
third means for generating an output signal representative of the Exclusive-OR function of the combined output signals from said first and second comparators, said output signal corresponding to the additional bit in the converter multibit digital output signal.

4,107,669

APPARATUS FOR ANALOG TO DIGITAL CONVERSION

Stuart Keene Tewksbury, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 608,524, Aug. 28, 1975, Pat. No. 4,017,849.
This application Jan. 3, 1977, Ser. No. 756,539
Int. Cl.[2] H03K *13/01*
U.S. Cl. 340—347 AD **5 Claims**



1. In a differential pulse code modulation encoder including means for converting an analog input signal into a digital output signal, a decoder for reconverting said output signal to a good prediction of said input signal, said decoder comprising

(1) first means including an N stage delay line having output taps 1 through N for receiving said output signal,

(2) N attenuators having attenuation coefficients a_1–a_n connected to respective ones of said output taps,

(3) second means for algebraically summing the outputs of said attenuators to form said good prediction, and

(4) third means for feeding back said good prediction to said first means, wherein said attenuation coefficients satisfy the relationship

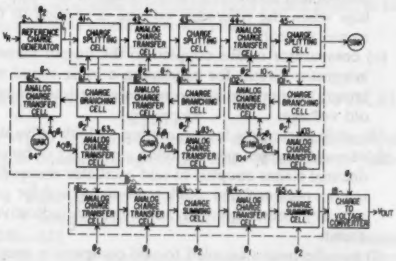
$$a_i = \frac{(-1)^{i+1} N!}{(N-i)!\, i!}, \quad i = 1,2 \ldots N.$$

4,107,670

CHARGE COUPLED DIGITAL TO ANALOG CONVERTER

Thomas Hornak, Los Altos, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 19, 1976, Ser. No. 677,955
Int. Cl.[2] H03K *13/02*
U.S. Cl. 340—347 DA **7 Claims**



1. A digital to analog converter comprising:

means for producing a reference charge;

charge dividing means coupled to receive the reference

charge for producing a plurality of binary weighted charge portions;

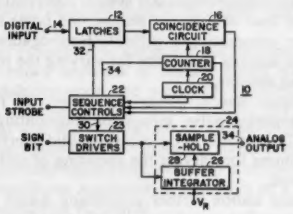
charge gating means coupled to receive the plurality of binary weighted charge portions and an applied digital signal having a plurality of bits for gating each of the plurality of binarily weighted charge portions in response to one value of the corresponding bit of the applied digital signal to thereby select it and for gating each of the plurality of binarily weighted charge portions in response to the other value of the corresponding bit of the applied digital signal to thereby sink it; and

charge summing means coupled to receive the selected binarily weighted charge portions and sum them to thereby generate a corresponding output analog quantity.

4,107,671
IMPROVED DIGITAL TO ANALOG CONVERTER PROVIDING SELF COMPENSATION TO OFFSET ERRORS

Robert Charles Huntington, Phoenix, Ariz., and James Everett Cooper, Jr., Woodland Hills, Calif., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 1, 1976, Ser. No. 719,550
Int. Cl.[2] H03K *13/02*
U.S. Cl. 340—347 DA **7 Claims**



1. Apparatus for converting an input digital signal into an analog output signal, comprising:

means receiving the input digital signal for storing the same during a conversion cycle;

counter means for producing digital signals;

comparator means for comparing the stored input digital signal and said digital signals produced by said counter means to provide an output signal therefrom upon coincidence occurring therebetween;

integrator means receiving a single polarity reference voltage for integrating the same during said conversion cycle such that an analog signal is produced at the output of said integrator means which is representative of both the magnitude and polarity of the stored input digital signal, said integrator means including a buffer circuit, first charge storage means, and an integrator circuit;

sample and hold circuit means for sampling the analog signal appearing at said output of said integrator means during predetermined times during said conversion cycle and then holding the value of said sampled analog signal to provide the analog output signal at an output thereof;

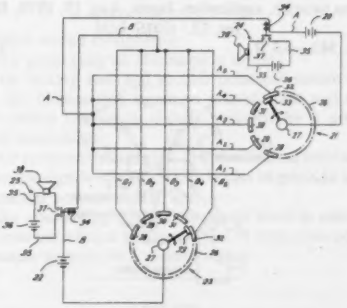
control circuit means responsive to an applied input signal for initiating said conversion cycle and for selectively enabling and disabling said counter means, said integrator means and said sample and hold circuit means during distinct portions of said conversion cycle, said control circuit means causing said buffer circuit, said first charge storage means and said integrator circuit to be coupled in a first configuration during a first portion of said conversion cycle such that said reference voltage is applied thereto to charge said first charge storage means, the polarity of said charge across said first charge storage means being in accordance with the polarity of said stored input digital signal, said control circuit means causing said counter means to be activated during a second portion of said conversion cycle, said control circuit means causing said buffer circuit, said first charge storage means and said integrator circuit to be coupled in a second configuration during said second portion of said conversion cycle such that said charge across said first charge storage means is integrated by said integrator circuit to produce said analog signal, said control circuit means being responsive to said output signal from said comparator means to terminate said second portion and to initiate a third portion of said conversion cycle, said control circuit means causing said first charge storage means and said buffer circuit to be decoupled from said integrator circuit during said third portion such that the value of said analog signal appearing at said output of said integrator means is maintained during said third portion of said conversion cycle; and

said control circuit means selectively coupling and then decoupling said sample and hold circuit means to said integrator means during said third portion and said first and second portions respectively of said conversion cycle.

4,107,672
APPARATUS AND METHOD FOR DETECTING CRACKS IN THE HEAT-INSULATING LINING OF A CONTAINER FOR COLD LIQUIDS

Arnoldus J. Van Riemsdijk, and Willem P. Hendal, both of Amsterdam, Netherlands, assignors to Shell Internationale Research Maatschappij B.V., The Hague, Netherlands

Filed Jan. 15, 1976, Ser. No. 649,562
Claims priority, application Netherlands, Jan. 22, 1975, 00739/75
Int. Cl.[2] G08B *13/21*
U.S. Cl. 340—605 **32 Claims**



1. A heat-insulated container apparatus for storage or transport of cold liquids having a rigid wall structure with a lining of heat-insulating material on the interior surface wall structure, wherein the improvement comprises:

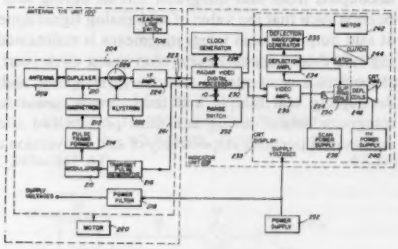
frangible electrical conductor means incorporated in the heat-insulating material; and

detector means linked with the conductor means to detect breakage in the electrical conductor means caused by cracks in the heat-insulating material attaining a critical length.

4,107,673
RADAR SYSTEM WITH IMPROVED BRIGHTNESS AND RESOLUTION

Fritz A. Gross; William M. Pease, both of Weston; John E. Meade, Lexington, and Harry Vickers, Oakham, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 612,882, Sep. 12, 1975, abandoned, which is a continuation of Ser. No. 413,130, Nov. 5, 1973, abandoned. This application Dec. 29, 1976, Ser. No. 755,320
Int. Cl.[2] G01S 7/06
U.S. Cl. 343—5 DP 25 Claims



1. In combination:

means for storing digital representations corresponding to a plurality of ranges of a radar return signal;

means for writing said representations into said storing means in a first time period;

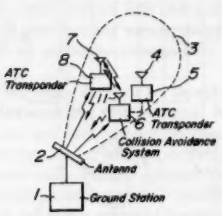
means for reading out said representations in a second time period, said second time period being greater than said first time period for the shorter ranges of a radar range setting and said second time period being constant for at least some ranges of said radar range setting; and

means for displaying said signal, said displaying means being coupled to said reading out means.

4,107,674
COLLISION AVOIDANCE SYSTEM FOR AIRCRAFTS

Chuhei Funatsu, Yokahama, and Toshikiyo Hirata, Samukawa, both of Japan, assignors to Toyo Tsushinki Kabushiki Jaka Toyo Communication Equipment Co. Ltd., Kawasaki, Japan

Filed Aug. 13, 1976, Ser. No. 714,335
Claims priority, application Japan, Aug. 15, 1975, 50-99674
Int. Cl.[2] G01S 9/56
U.S. Cl. 343—6.5 R 11 Claims



1. A collision avoidance system for aircraft each equipped with an ATC transponder comprising;

an interrogation station mounted on one aircraft, having secondary surveillance radar function emitting an interrogation signal to be responded to by the ATC transponder of a second aircraft,

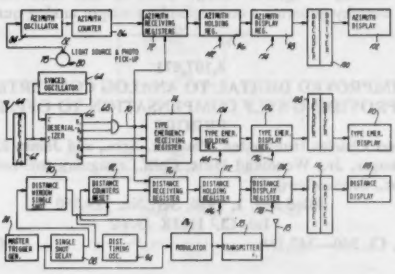
coarse detection means on said one aircraft for detecting the existence of the second aircraft in proximity to said one aircraft, and

output control means for altering at least one of output power and transmission period of the interrogation signal so as to effect fine detection of said second aircraft when said coarse detection means delivers a signal representing information concerning said second aircraft which exceeds a certain value.

4,107,675
TRANSPONDER-RESPONDER SYSTEM

John C. Sellers, 8702 Morton Ave., Brooklyn, Ohio 44144, and James A. Romanauski, 8800 Farbar, Kirtland, Ohio 44094

Filed Mar. 4, 1977, Ser. No. 774,520
Int. Cl.[2] G01S 9/56
U.S. Cl. 343—6.5 LC 7 Claims



1. A transponder-responder system comprising a home station and at least one remote station, said home station having means for transmitting a periodic interrogation pulse via a directional antenna and means for varying the rotational position of said antenna,

said remote station comprising means for receiving said interrogation pulse, means for transmitting an encoded signal is response to the receipt of said interrogation pulse, and means for varying the encoding of said encoded signal, and

said home station further comprising means for receiving said encoded signal, means for decoding said encoded signal, means for determining the elapsed time between the transmission of the last interrogation pulse and the receipt of said encoded signal, means for determining the rotational position of the directional antenna and means for storing two encoded signals from two remote stations, said storing means further comprising a receiving register for storing the rotational position of said antenna, the decoded signal and said elapsed time upon the receipt of said encoded signal, the output of each receiving register being connected to the input of a holding register, the output from each holding register being connected to the input of a display register and means for displaying the contents of each display register, and upon receipt of two successive encoded signals by the home station, means for automatically loading the display registers with information pertinent to the first received encoded signal and for automatically loading the holding registers with information pertinent to the second received encoded signal.

4,107,676
TRANS-HORIZON NAVIGATION SYSTEM

James W. Lassiter, P.O. Box 158, Ocala, Fla. 32617

Filed Nov. 2, 1977, Ser. No. 847,766
Int. Cl.[2] G01S 9/56, 9/04
U.S. Cl. 343—6.5 R 10 Claims

1. In a trans-horizon navigation system, the improvement comprising:

a first transceiver comprising:

a modulator providing a modulation code comprised of a predetermined sequence of control pulses, each of said control pulses having a predetermined one of mutually exclusive first and second states;

an exciter connected to the modulator, the exciter receiving the modulation code and providing a phase-

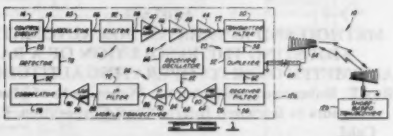
modulated RF signal having a first phase in response to a received control pulse in the first state and a second phase in response to a received control pulse in the second state;

transmitting means connected to the exciter for receiving the phase-modulated RF signal and for transmitting the received phase-modulated RF signal; and

a second transceiver comprising:

receiving means for receiving the transmitted phase-modulated RF signal and for providing the received phase-modulated RF signal;

a receiver oscillator providing an RF signal having a predetermined frequency relative to the frequency of the phase-modulated RF signal;



a mixer connected to the receiving means and to the receiver oscillator, the mixer receiving the received phase-modulated RF signal and the RF signal, and providing an IF signal having a frequency proportional to the difference in frequency between the frequency of the received phase-modulated RF signal and the frequency of the RF signal; and

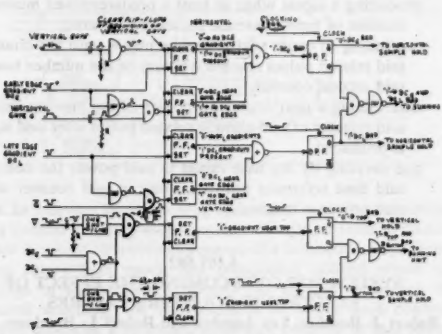
a correlator connected to the mixer and responsive to the predetermined sequence of control pulses comprising the modulation code, the correlator receiving the IF signal, detecting the correlation between the received IF signal and the predetermined sequence of control pulses, and providing a correlation signal proportional to the detected correlation, whereby a correlation signal of significant amplitude is indicative of a received phase-modulated RF signal.

4,107,677

GATE TRACKING TECHNIQUE UTILIZING DIMENSION MEMORY

Robert Zwirn, Encino, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 25, 1972, Ser. No. 274,540
Int. Cl.[2] G01S *9/02*
U.S. Cl. 343—7 A **4 Claims**



1. A target tracking apparatus to track and measure the dimensions of a target comprising in combination:

means for measuring the target extremities, said measuring means providing a gate to enclose said target, said measuring means generating a horizontal and a vertical voltage ramp, said horizontal and vertical voltage ramps defining the field of view of said target, said horizontal voltage ramp defining said target's left leading and right trailing edges, said vertical voltage ramp defining said target's upper leading and lower trailing edges, said horizontal and vertical voltage ramps provide four analog voltages, V_{T_L}, V_{T_R}, V_{T_T} and V_{T_B} which define the target extremities,

a dimension and center processor unit receives said four analog voltages, V_{T_L}, V_{T_R}, V_{T_T} and V_{T_B} and stores their values, said dimension and center processor unit processes said four analog voltages to determine the center of said target, said dimension and center processor unit processes said four analog voltages to determine the locations of said target's extremities, said dimension and center processor unit generates gate size and position command signals relative to said target, and,

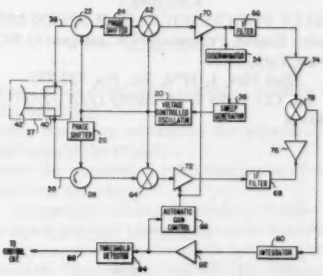
a tracking logic unit for controlling said dimension and center processor unit, said tracking logic unit determining when a part of said target extends beyond said gate, said tracking logic unit adjusting said gate size to enclose said target, said tracking logic unit commanding said dimension and processor unit to enclose said target.

4,107,678

POLARIZATION CORRELATION TARGET SEEKER

Norman F. Powell, Ilchester, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 28, 1976, Ser. No. 727,506
Int. Cl.[2] G01S *9/02*; F41G *7/00*; H04B *7/10*
U.S. Cl. 343—7 ED **19 Claims**



1. A seeker circuit comprising:

means for generating an illumination signal;

means for mixing first and second polarized return signals with the illumination signal to provide first and second intermediate frequency signals bounded by a predetermined bandwidth;

means for cross-correlating the first and second intermediate frequency signals of said mixing means to provide a cross-correlation product signal; and

means for comparing a target threshold level in relation to the cross-correlation product signal of said cross-correlating means to provide a control signal.

4,107,679

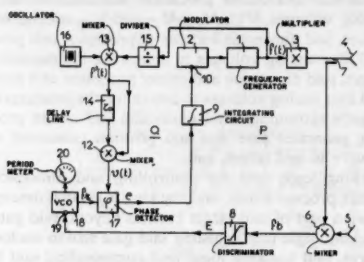
FREQUENCY MODULATOR FOR HIGH-PRECISION RANGE MEASUREMENTS

Raymond Strauch, Viroflay, and Michel Riffiod, Paris, both of France, assignors to Telecommunications Radioelectriques et Telephoniques T.R.T., Paris, France

Filed Mar. 14, 1977, Ser. No. 777,110
Claims priority, application France, Mar. 12, 1976, 76 07058
Int. Cl.[2] G01S *9/26*
U.S. Cl. 343—7.5 **4 Claims**

1. A range measuring apparatus, particularly for altitude measurements, comprising a generator controlled by a modulator for supplying a signal whose frequency is linearly modu-

lated, means for emitting towards a target a wave which corresponds to the signal of said generator, means for receiving the wave reflected by the target, means for forming a beat signal between the signals which correspond to the transmitted and received waves, means for forming an error signal which corresponds to the frequency variation between the frequency of the beat signal and a fixed frequency, means for forming a



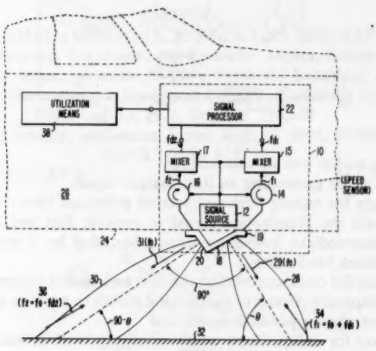
permanent second beat signal between two signals which are obtained from said generator and one of which is delayed by a delay line, a phase detector which receives said second beat signal and a signal from a controlled frequency oscillator, wherein the output signal of the phase detector controls the slope of the modulation signal supplied by the modulator while said error signal controls the frequency of the signal of said oscillator.

4,107,680

DIGITALLY PROCESSED RADAR SPEED SENSOR

Gerald Stanley Kaplan, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 1, 1976, Ser. No. 737,777
Int. Cl.[2] G01S *9/46*; H01Q *1/32, 21/00*
U.S. Cl. 343—8 **5 Claims**



1. In a Doppler speed sensor of the type for sensing motion of a vehicle parallel to a surface including a signal source for generating a signal of predetermined frequency, an antenna network for radiating said predetermined frequency signal as probe signals in predetermined directions to impinge on said surface, said antenna network further receiving portions of said probe signals reflected from said surface, said reflected signal portions being Doppler shifted in frequency from said predetermined frequency by an amount in accordance with the relative velocity of said signal source on said vehicle with respect to said surface, said speed sensor further including a signal processor responsive to said received signal portions and a signal indicative of said probe signals for producing a signal indicative of said relative velocity, the improvement wherein:

said antenna network comprises first and second antennas and means for maintaining the principle axes of the respective radiation patterns of said first and second antennas disposed 90° apart,

said antenna network means including means for mounting said antennas on said vehicle at a mounting angle relative to said vehicle such that said respective probe signals from said antennas impinge on said surface, and

said signal processor comprises means, responsive to said received reflected signals from said first and second antennas, for generating a signal indicative of a root mean square value of said Doppler frequency shifts,

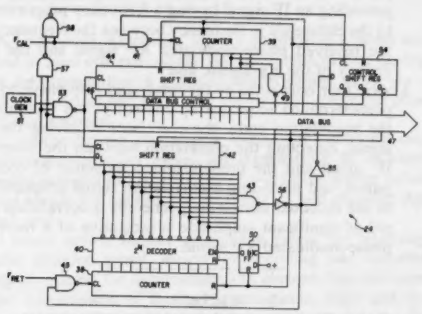
whereby said signal is independent of any angle of mounting of said antennas to said vehicle and also independent of any angle of tilt of said vehicle.

4,107,681

METHOD AND APPARATUS FOR AUTOMATICALLY ADJUSTING THE RESOLUTION OF A RADIO ALTIMETER OVER ITS OPERATING ALTITUDE RANGE

Roy E. Robertson, and Robert J. Weber, both of Marion, Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed May 26, 1977, Ser. No. 800,685
Int. Cl.[2] G01S *9/28*
U.S. Cl. 343—12 A **9 Claims**



3. A method for automatically adjusting the resolution of a CWFM radio altimeter over a range of altitudes comprising:

producing pulses having a period relatable to the altitude to be measured,

counting said altitude related pulses,

generating time referenced pulses,

counting said time reference pulses in a counter,

producing a signal when at least a predetermined minimum number of time reference pulses are counted,

continuing to count said reference pulses until the count of said related pulses reaches a power of the number base of said second counter,

determining a next occurring power of the number base of said counter of said altitude related pulses after said signal is produced,

and dividing by the base raised to said power the count of said time reference pulses existing in said counter when said power is reached.

4,107,682

SYSTEM FOR OVERCOMING THE EFFECT OF ELECTRONIC COUNTERMEASURES

Robert J. Boucher, Los Angeles, and Robert L. Brackney, Jr., Whittier, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Apr. 5, 1967, Ser. No. 629,864
Int. Cl.[2] G01S *7/36, 9/22*
U.S. Cl. 343—16 M **7 Claims**

1. A radar system comprising

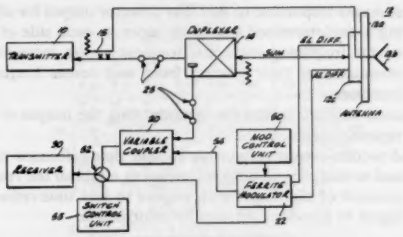
an antenna defining four quadrants;

a transmitter;

means for transmitting energy from said transmitter through said antenna, with the energy in said four quadrants in phase;

a receiver adapted to receive energy patterns received by said antenna; and

control means interposed between said receiver and said antenna and including microwave switching means, controllable by said control means to couple said receiver to said antenna to receive, in a conventional mode of reception, sum energy which is a function of the energy received in said four quadrants in phase, a first energy difference between the energy received in two quadrants defining the upper portion of said antenna and the energy received between two other quadrants defining the lower portion of said antenna, and a second energy difference between the energy received by two quadrants defining the right half of said antenna and the energy received by the other two quadrants defining the left half of said antenna, said control means further controlling said microwave switching means to couple said receiver to said antenna in a countering reception mode to receive energy which includes at least one of said energy differences.



4,107,683

DEVICE FOR CONTROLLING THE CONICAL SCANNING FREQUENCY FOR CONICAL SCANNING RADAR SYSTEMS

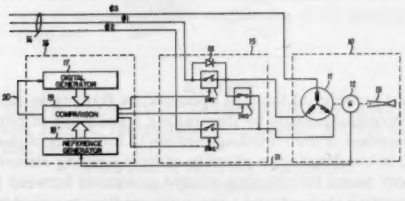
Filippo Neri, and Alfredo Albrande, both of Rome, Italy, assignors to Selenia-Industrie Elettroniche Associate S.p.A., Italy

Filed Mar. 15, 1977, Ser. No. 777,813

Claims priority, application Italy, Sep. 16, 1976, 51310 A/76

Int. Cl.[2] G01S 7/36

U.S. Cl. 343—18 E **3 Claims**



1. In a device for controlling the conical scanning frequency of a conical scanning radar system, wherein an antenna illuminator is caused to revolve by means of a three-phase asynchronous rotary field motor and comprising control means to change in an incoherent manner the angular frequency of conical scanning, the improvement in which said control means comprise a reference generator coupled to said asynchronous motor, a random or pseudo-random signal generator, and a comparison circuit for comparing the signal of said reference generator and the signal of said signal generator, said comparison circuit having "greater", "less" and "equal" outputs, first switching means driven by said outputs for imposing a braking magnetic field or the entire three-phase voltage, respectively, to said motor, in correspondence with a "greater" or a "less" output, respectively, from said comparison circuit, said "equal" output controlling a change of state for said random or pseudo-random signal generator.

4,107,684

PHASE LOCKED DETECTOR

Charles A. Watson, Jr., Greenville, Tex., assignor to E-Systems, Inc., Dallas, Tex.

Filed May 2, 1977, Ser. No. 792,931

Int. Cl.[2] G01S 9/40; G01D 21/04

U.S. Cl. 343—7.5 **13 Claims**

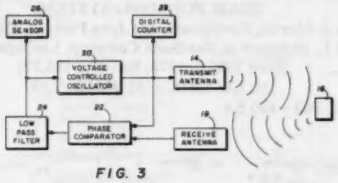


FIG. 3

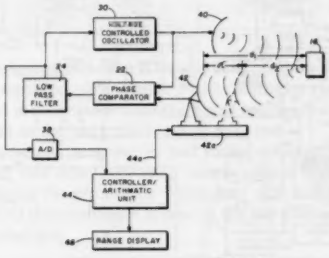


FIG. 4

1. Apparatus for detecting a change in position of an object in a field comprising:

a variable frequency transmitter for generating a transmit signal toward the object;

a receiver for receiving a reflection signal of said transmit signal from the object;

phase comparator means connected to receive said reflection signal and said transmit signal for generating an output signal applied to said variable frequency transmitter to control the frequency of said variable frequency transmitter to thereby maintain a predetermined phase relationship between said transmit signal and said reflection signal, such that the frequency of said transmit signal depends on the distance between the object and said variable frequency transmitter; and

means connected to said phase comparator means for continuously monitoring said output signal to provide an indication of a change in position of the object in the field.

8. A range finder for determining the range to an object comprising:

a variable frequency transmitter for generating a transmit signal toward the object;

a receiver for receiving a reflection signal at a first and second position of said transmit signal from the object, the distance between said first and second positions differing by a predetermined distance;

phase comparator means connected to receive said reflection signal and said transmit signal for generating an output applied to said variable frequency transmitter to control the frequency of said variable frequency transmitter to thereby maintain a predetermined phase relationship between said transmit signal and said reflection signal when said receiver is located at said first and second positions;

means for moving said receiver between said first and second positions;

means for calculating a difference frequency, being the

difference between said transmit frequency generated by said variable frequency transmitter when said receiver is in said first position and when said receiver is in said second position;

means for determining the range to the object by calculating a ratio between said transmit frequency generated by said variable frequency transmitter when said receiver is in said first position increased by a factor of said predetermined distance between said first and second positions and said difference frequency; and

means for displaying the calculated range to the object.

4,107,685

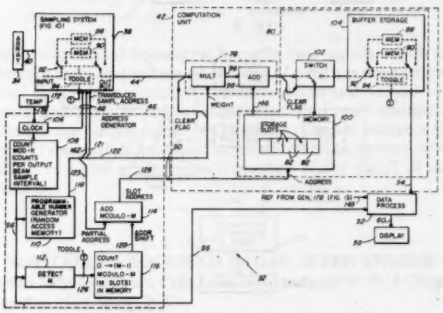
BEAM FORMING SYSTEM

Walter J. Martin, Portsmouth, and John Furtado, Tiverton, both of R.I., assignors to Raytheon Company, Lexington, Mass.

Filed Dec. 1, 1976, Ser. No. 746,276

Int. Cl.[2] G01S *3/80*; H04B *11/00*

U.S. Cl. 343—100 SA **12 Claims**



9. In combination:

a memory having locations for the storage of signals, each of said locations being identified by an address;

means connected to said memory for coupling said signals to the radiating elements of an array of radiating elements, said coupling means comprising an address generator, a counter, and a combiner;

said address generator producing repetitively sequences of partial addresses;

said counter counting said sequences modulo-M where M represents a number of said locations; and wherein

said combiner is connected to said generator and to said counter for combining said partial addresses with counts of said counter to produce addresses for said locations.

4,107,686

SCANNING BEAM RECEIVER SYSTEM WITH COHERENT POST-DETECTION SIGNAL PROCESSING

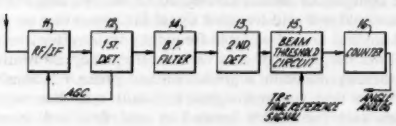
Paul Barton, Stortford, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Jan. 25, 1977, Ser. No. 762,259

Claims priority, application United Kingdom, Jan. 29, 1976, 3507/76

Int. Cl.[2] G01S *1/44*

U.S. Cl. 343—106 R **8 Claims**



1. In a time-reference scanning beam receiving system, radio navigation apparatus for generating air-derived angular information, responsive to ground-based means for transmitting a radio frequency beam scanned through a sector of space and including means for providing a time-reference signal related to said beam scan, said ground-based means also including means for provision of an offset-frequency reference signal through one of a plurality of arrangements at least including continuous illumination of said scanned sector and generation of said reference within said receiving system, comprising:

first detector means responsive to signals of said scanned beam and said offset-frequency reference to produce a first detector output centered about the frequency of said offset reference and having a spectral width which is a function of the aperture of the antenna transmitting said scanned beam;

first means responsive to said first detector output for effecting a predetermined amplitude taper on each side of said center frequency such that frequencies are increasingly attenuated as their spacing from said center frequency increases;

second detector means for demodulating the output of said tapering means;

and second means responsive to said time-reference signal and to said second detector means to establish the relative position of said beam with respect to said time-reference signal to provide said angular information.

4,107,687

RECORDING DEVICE

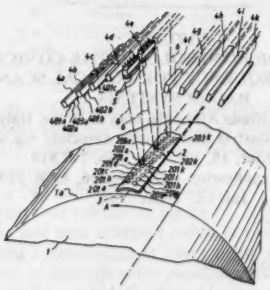
Josef Pfeifer, Unterhaching; Rudolf Paulus, Munich; Walter Gutmann, Lochhofen, and Michael Resch, Munich, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed Jul. 13, 1977, Ser. No. 815,414

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1976, 2631848

Int. Cl.[2] G01D *9/42*; B41B *13/10*

U.S. Cl. 346—107 R **6 Claims**



1. In a recorder of the type operative for forming an image on a recording-medium by illuminating a multitude of points on the surface of the recording-medium to form lines of image points, in combination, a plurality of light-emitting elements; transport means for effecting relative movement between the light-emitting elements and a recording-medium in a predetermined transport direction, the light-emitting elements being arranged distributed both in the transport direction and in a direction transverse to the transport direction; and a plurality of projector lenses operative for simultaneously projecting reduced-scale images of the light emitted by all of the light-emitting elements onto a portion of the recording-medium on which a single line of image points is to be formed, the plurality of light-emitting elements being constituted by groups of light-emitting elements, each group of light-emitting elements containing a plurality of light-emitting elements distributed in a direction transverse to the transport direction, each projector lens being dimensioned and oriented to project onto said por-

tion of the recording-medium images of the light emitted by a respective one of the groups of light-emitting elements.

4,107,688

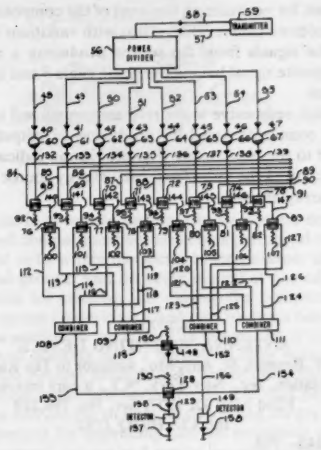
MONITOR FOR LOCALIZER ANTENNA ARRAYS

Andrew Alford, 71 Bacon St., Winchester, Mass. 01890

Filed Dec. 15, 1975, Ser. No. 640,749

Int. Cl.[2] G01S *1/16*

U.S. Cl. 343—108 R **4 Claims**



1. A monitor for a localizer antenna array with a plurality of radiating elements comprising:

(1) Means for obtaining sample currents proportional to the currents in the radiating elements,

(2) Means for impedance matching each sampling means,

(3) Means for dividing sample currents into three sets of parts in accordance with fixed proportions,

(4) Means for combining the first set of sample currents using equal electrical paths and adding networks to obtain a resultant used to indicate course position,

(5) Means for combining a second set of currents using electrical paths in proportion to the distances from an end element to each of the other elements in the array,

(6) Means for comparing the magnitude of the current samples in the third set with present standards and

(7) Means for reducing interference by the first and second sets of samples with the magnitudes of the samples in the third set.

4,107,689

SYSTEM FOR AUTOMATIC VEHICLE LOCATION

Ernest Jellinek, Haddonfield, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 7, 1976, Ser. No. 694,042

Int. Cl.[2] G01S *3/02*

U.S. Cl. 343—112 TC **10 Claims**

1. A system for monitoring the position of a mobile unit within a predetermined area comprising:

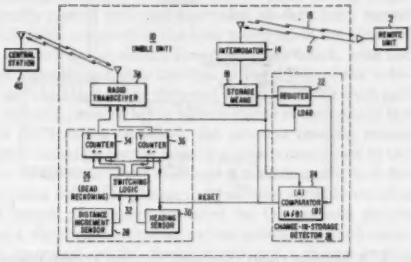
dead reckoning means, within said mobile unit, for generating an output signal indicative of the instantaneous location coordinates of said mobile unit on a predetermined coordinate system;

a plurality of remote unit means, each means comprising a unit positioned at a respective predetermined location within said area, for communicating to said mobile unit information signals indicative of said respective predetermined locations as said mobile unit passes each remote unit at the respective locations;

each of said units representing a separate coordinate system wherein the location of each of said units represents the reference coordinates for its associated coordinate system,

storage means, in said mobile unit, receptive of said remote unit location signals, for storing thereby the information signal indicative of the location of the last communicating unit;

resetting means, cooperating with said storage means, for generating a reset signal in response to changes in said stored information, said reset signal being applied to said



dead reckoning means to reset said dead reckoning means output signal to zero, whereby said coordinate system is changed in accordance with the stored information corresponding to the last passed remote unit; and

utilization means, receptive of said stored information signals and said dead reckoning means output signal, for determining therefrom said position of said mobile unit relative to the coordinate system of the last communicating remote unit.

4,107,690

ANTENNA ARRANGEMENT FOR RADAR OR DIRECTION FINDING PURPOSES RESPECTIVELY, WITH SUM AND DIFFERENCE PATTERNS

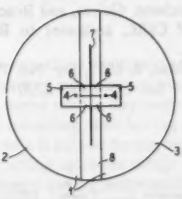
Giswalt V. Trentini, Munich, and Werner Jatsch, Neubiberg, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Jul. 26, 1973, Ser. No. 385,589

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1972, 2245346

Int. Cl.[2] G01S *3/46*

U.S. Cl. 343—113 R **9 Claims**

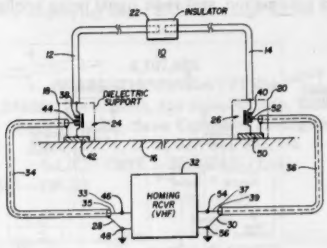


1. An antenna arrangement for radar or direction finding purposes having sum-difference patterns for monopulse operation, comprising: a reflector; two linearly polarized exciters located approximately centrally of and spaced from said reflector; a metallic conductive planar partition disposed between said two exciters and extending to said reflector, said partition disposed perpendicular to said reflector, said partition extending over only a portion of said reflector approximately in the area of said exciters; and a comparator connected to said exciters for a sum-difference operation so that the exciter located on one side of said partition can be compared with the exciter located on the other side of said partition with respect to voltage.

4,107,691
ANTENNA FOR PHASE FRONT HOMING

Donn V. Campbell, Eatontown, N.J., and Edward J. Paragi, New Haven, Ind., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 18, 1977, Ser. No. 760,320
Int. Cl.[2] G01S 3/20; H01Q 1/48
U.S. Cl. 343—120 10 Claims



1. A homing radio receiving antenna system comprising in combination:

an electrically conductive ground plane;

first and second spaced apart dielectric support means secured to said ground plane;

first and second substantially like antenna elements each having a bend therein defining a pair of angulated antenna portions one respective end of which terminates in respective said first and second dielectric support means;

an electrically non-conductive joint commonly terminating the other respective end of said pair of angulated portions in a single plane including said support means, said non-conductive joint supporting said other end of said pair in a spaced apart relation;

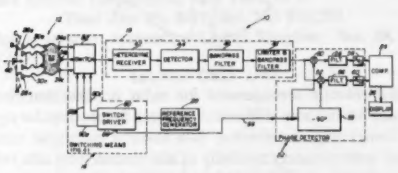
homing radio receiving means having a pair of signal inputs; and

electrical circuit means including first and second symmetrical electrical impedance means respectively coupled to said pair of inputs and to said angulated portions terminating in said support means for translating received signals from both said first and second antenna elements to said receiving means.

4,107,692
RADIO FREQUENCY SIGNAL DIRECTION FINDING SYSTEM

Robert Stewart Hutcheon, Goleta, and Bruce E. Gordon, Santa Barbara, both of Calif., assignors to Raytheon Company, Lexington, Mass.

Filed Mar. 9, 1977, Ser. No. 776,077
Int. Cl.[2] G01S 3/20
U.S. Cl. 343—120 4 Claims



1. Apparatus for determining the direction of a source of radio frequency signals comprising:

(a) an array antenna adapted to receive radio frequency signals from such source and direct such received signals to feed ports of such antenna, the level of the signals being related to the direction of the source relative to the array antenna;

(b) means, including a sampling reference signal source, for sampling the radio frequency signals directed to the feed ports in response to such sampling signal, such signals being sampled at a sampling frequency, f_s,

(c) bandpass filter means, tuned to the sampling frequency f_s and fed by the sampled signals, for producing a composite signal having a frequency component, f_s, and a phase angle, θ, relative to the phase angle of the reference signal, the relative levels of the received signals being related to the phase angle, θ;

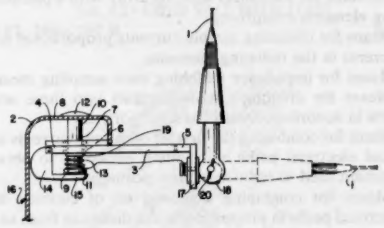
(d) limiter means, coupled to the output of the bandpass filter means, for normalizing the level of the composite signal to a predetermined level invariant with variations in the level of the signals from the source producing a normalized composite signal having the phase angle θ and a frequency f_s; and

(e) means, responsive to the reference signal and the normalized composite signal for producing an output signal related to the phase angle θ to provide an indication of the direction of the radio frequency energy source relative to the array antenna.

4,107,693
ANTENNA MOUNTING DEVICE

Cleatus W. Bennett, St. Ann, Mo., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed May 12, 1977, Ser. No. 796,229
Int. Cl.[2] H01Q 1/32
U.S. Cl. 343—715 3 Claims



1. An antenna mounting device for mounting a radio antenna on an automotive vehicle, said antenna mounting device comprising

a bracket member having spaced opposite first and second ends, said bracket member having a bore formed therethrough in the area of the first end thereof;

a stud extending through the bore of the bracket member and mounted on the vehicle, said stud having spaced opposite ends and a head at each end;

a spiral spring coaxially positioned on the stud and extending between one head of the stud and the bracket member;

a cam member pivotally affixed to the bracket member at the first end thereof and having a projecting portion abutting the one head of the stud in one position to raise the bracket member on the stud and is spaced from the stud in another position to lower the bracket member;

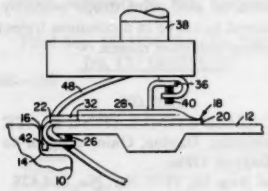
an arm extending substantially perpendicularly from the bracket member at the second end thereof; and

rotary mounting means rotatably mounting an antenna on the arm in a manner whereby in its releasably securable extended position the antenna extends substantially parallel to the arm and perpendicular to the bracket member and in its releasably securable storage position the antenna extends substantially parallel to and beyond the bracket member and perpendicular to said arm.

4,107,694
SEPARABLE BRACKET FOR SUPPORTING AN ANTENNA ON A VEHICLE TRUNK LID

Lewis Coleman Morgan, Sherwood, and Clarence Arthur Reed, N. Little Rock, both of Ark., assignors to Arthur W. Reed Machine Co., Little Rock, Ark.

Filed Jun. 6, 1977, Ser. No. 803,745
Int. Cl.² H01Q 1/32
U.S. Cl. 343—715 **8 Claims**

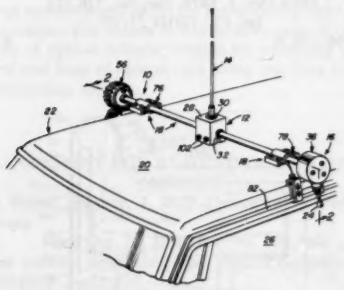


1. For use in a vehicle having a body portion defining an open-topped compartment bordered by a peripheral recess and a lid shaped to fit within the access in such manner as to leave a peripheral groove, said lid being hinged at one edge to the body portion for opening and closing the compartment: an accessory mount comprising a first part having a base adapted to overlie a portion of the lid and an integral hook portion for receiving and hooking over a peripheral edge portion of the lid, said hook portion having means for securing the first part to the adjacent under-portion of the lid, a second part overlying the base and having an integral depending ear proximate to the hook portion for depending into the proximate portion of the compartment groove and means on said second part for carrying an accessory, cooperative disengageable elements respectively on the two parts for selective engagement and disengagement only when the lid is open, said lip, being received in the groove when the lid is closed, preventing disengagement of the parts.

4,107,695
ANTENNA RAISING AND LOWERING DEVICE

Donald E. Urban, and Alan G. Urban, both of 7950 SW. 184th St., Miami, Fla. 33157

Filed Aug. 11, 1976, Ser. No. 713,609
Int. Cl.² H01Q 15/20
U.S. Cl. 343—882 **3 Claims**



1. An antenna raising and lowering device, comprising, in combination:

(a) antenna mount means for receiving an antenna;

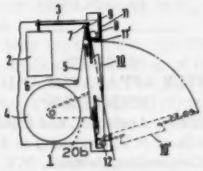
(b) antenna rotating means for turning the antenna mount means between an upright raised position and a lowered position adjacent the roof of a motor vehicle on which the device is to be mounted; and

(c) clamp means for securing the antenna mount means and the antenna rotating means on the roof of the motor vehicle, the antenna rotating means including an actuating handle arrangeable adjacent a driver's side door window of the motor vehicle and connected to the antenna mount means, lock means associated with the handle for retaining the handle in the raised position and lowered position of the antenna rotating means, the antenna mount means being disposed centrally of the width of the motor vehicle and including a block provided with a recess arranged for receiving an antenna and with a through hole, and the antenna rotating means further including a longitudinally extending, rotatably mounted, hollow shaft having longitudinally spaced ends and journaled on the clamp means and fittingly received in the hole provided in the block of the antenna mount means for rotating the block, with the shaft being arrangeable traverse of the width of the vehicle and the block being disposed centrally of the shaft and the actuating handle being affixed to one of the ends of the shaft for rotating the shaft, the antenna rotating means further including torque adjusting means connected to the other of the ends of the shaft and spaced from the lock for providing sufficient torque to overcome variable weights and length of antenna mounted on the antenna mount means, the torque adjusting means including a knob rotatably mounted on the clamp means and a torsion spring disposed within the hollow shaft and connected to the knob and to the shaft for rotation with each, and a lock pin keyed to the clamp means and selectively engaging the knob for retaining the knob against rotation.

4,107,696
RECORDER

Arthur Wondra, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Apr. 18, 1977, Ser. No. 788,314
Claims priority, application Fed. Rep. of Germany, May 7, 1976, 2620302
Int. Cl.² G01D 15/28
U.S. Cl. 346—24 **13 Claims**

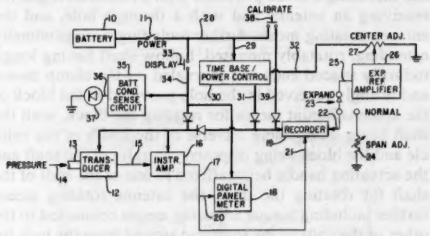


1. A recorder for recording electronic analogue signals on a moving strip of recording media comprising: a housing having a signal responsive meter device disposed therein actuating an indicator, a foldout recording table having a writing edge over which recording media is moved during operation of the apparatus, the indicator acting upon the media at the edge, a drive disposed in said housing having a drive roll positioned closely adjacent the writing edge of the writing table when the writing table is in a closed position, a tear-off edge positioned adjacent said drive, the recording table formed of two stacked rectangular plates, one of said plates pivotably attached to the housing, the plates interconnected by side guide members, the side guide members having longitudinal end recesses into which side margins of the plates project, at least one of the plates being longitudinally movable with respect to the side guides whereby the plates are longitudinally movable with respect to one another, the recording table having a closed position with an end of the table remote from the pivot connection projecting longitudinally into the recorder housing whereby the plates may be longitudinally moved to withdraw the end from the housing.

4,107,697
PRESSURE RECORDER WITH POWER CONSERVATION MEANS

Oliver W. McCracken, Richardson, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Aug. 3, 1977, Ser. No. 821,489
Int. Cl.² G01D *9/00*
U.S. Cl. 346—33 R **13 Claims**

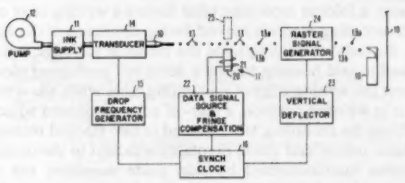


1. In a recording voltmeter apparatus comprising a driven chart recorder and chart imprinting stylus, with said chart being drivable at a predetermined rate and said stylus being deflectable in proportion to an input voltage from a pressure-voltage transducer; means responsive to a selectable first operating mode to power said transducer and chart recorder at predetermined periodic intervals to define a predetermined power application duty cycle, with deflection of said stylus with a predetermined sensitivity from a chart-edge extreme being proportional to an input voltage to be recorded, means responsive to a selectable second operating mode to effect a continuous readout from digital display means of said input voltage being measured, means enabled during said second operating mode to effect centering of said stylus on said chart, and means operable in a third operating mode to effect, with sensitivity substantially greater than such predetermined sensitivity, stylus deflection over a predetermined range either side of said centered stylus position with said transducer and chart recorder being powered at said predetermined power application duty cycle.

4,107,698
INK JET PRINTER APPARATUS AND METHOD OF OPERATION

Louis Valentine Galetto, Apalachin, and Donald Frederick Jensen, Endicott, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 10, 1977, Ser. No. 767,403
Int. Cl.² G01D *15/18*
U.S. Cl. 346—75 **6 Claims**

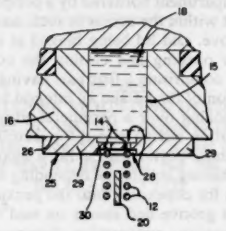


1. An ink jet printer apparatus comprising in combination,
means for projecting a continuous stream of individual ink drops toward a print medium;
means for selectively removing unwanted ink drops from said stream while allowing print drops to be deposited on said print medium including,
drop collector means positioned to prevent unwanted drops from depositing on said print medium,
selector means operable for deflecting ink drops of said stream for interruption by said drop collector; and
control means for operating said selector means for applying a first selection force capable of deflecting unwanted ink drops of said stream into a trajectory leading to said drop collector,
said control means including means for operating said selector means for applying to at least some of the print drops of said stream a second deflection force which compensates for fringe deflection forces produced by said first selection force on said print drops whereby said print drops are caused to move in a common trajectory which avoids said drop collector means.

4,107,699
TRENCHED STIMULATING PLATE

E. J. Doyle Kenworthy, Dayton, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Aug. 15, 1977, Ser. No. 824,425
Int. Cl.² G01D *15/18*
U.S. Cl. 346—75 **9 Claims**

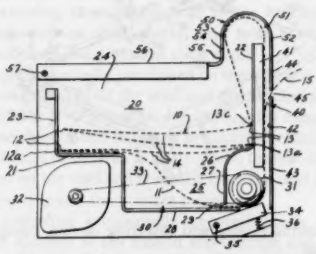


8. An orifice plate for a jet drop recording head comprising a marginal portion and a medial portion along which is arranged a row of regularly spaced orifices, characterized in that said marginal portion is rigid and in that said medial portion is a thin, flexible and acoustically conductive region defined by an elongated trench extending medially along the length of said plate.

4,107,700
FANFOLD PAPER TRANSPORT

Eugene R. Jornod, Caledonia, Ill., assignor to Barber-Colman Company, Rockford, Ill.

Filed Oct. 1, 1976, Ser. No. 728,722
Int. Cl.² G01D *15/30*
U.S. Cl. 346—76 R **9 Claims**



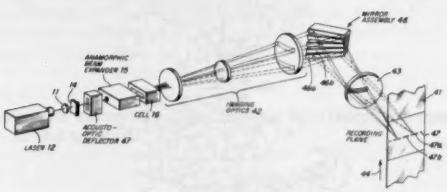
1. A fanfold strip transport comprising a substantially horizontal receptacle having a bottom, sides, and front and back ends for confining a flexible strip in a fanfolded pack configuration, a recess in the bottom of said receptacle intermediate the ends, a feed roll adjacent said recess for progressively withdrawing said strip through the recess, a channel adjacent said

front end for directing upwardly the withdrawn strip, and a guide for deflecting said upwardly directed strip backwardly and downwardly into the receptacle at a location such that said strip automatically resumes the fanfolded pack configuration.

4,107,701
ACOUSTO-OPTIC SNAPSHOT RECORDER

Robert A. Sprague, Chelmsford, and Alan J. MacGovern, Acton, both of Mass., assignors to Itek Corporation, Lexington, Mass.

Filed Sep. 16, 1976, Ser. No. 723,878
Int. Cl.[2] G01D *9/00*
U.S. Cl. 346—108 **5 Claims**



1. Acousto-optic recording apparatus for reading out a serial electrical signal as spatial optical data comprising:

A. acousto-optic means;

B. means for passing a continuous travelling acoustic wave through said acousto-optic means, said acoustic wave being proportional to said serial electrical signal;

C. a recording medium;

D. imaging means for imaging said acoustic wave on said recording medium, said imaging means including:

a. light source means for illuminating said acousto-optic means;

b. optical means for imaging the light from said acousto-optic means onto said recording medium; and,

c. means for "stopping" the motion of said travelling acoustic wave passing through said acousto-optic means for recording a stationary line of optical data on said recording medium proportional to the acoustic wave within said acousto-optic means; and,

E. means for recording a plurality of said lines of optical data along one long line on said recording medium, including:

a. a plurality of optical deflector means in the path of the light from said acousto-optic means to direct images to different locations on said recording medium; and

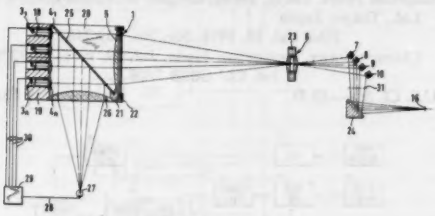
b. an acousto-optic deflector for directing light from said acousto-optic means to consecutive ones of said plurality of optical deflector means for recording a plurality of said lines of optical data along one long line on said recording medium.

4,107,702
ARRANGEMENT FOR READING OUT AN OPTICAL MEMORY

Johann Plockl, Jagdstr. 4, 8025 Unterhaching, Fed. Rep. of Germany

Filed Oct. 18, 1976, Ser. No. 733,718
Claims priority, application Fed. Rep. of Germany, Oct. 30, 1975, 2548649
Int. Cl.[2] G03B *17/08*
U.S. Cl. 354—17 **6 Claims**

1. An arrangement for reading out selected characters from a font of characters stored on a stationary optical memory, comprising a number of light sources each associated with one of said characters for illuminating the same selectively, all of said characters being imaged onto a common location by an optical arrangement comprising one lens and first and second sets of optical elements performing together said imaging onto a common location, the lens imaging the characters into a common image plane, said first set of said optical elements deflecting the different rows of said characters onto said common location, said second set of said optical elements deflecting the different columns of said characters onto said common location each of said first and second sets of optical elements comprising a plurality of individual flat mirrors operating as optical deflecting members for combining the images of the characters at said common location, said arrangement further comprising mounting means for each plurality of deflecting members to maintain said sets of deflecting members in respective predetermined, fixed positions relative to each other on

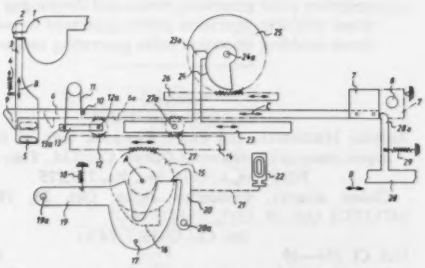


opposite sides of a common plane, and wherein each mirror deflecting member faces said common plane with its reflecting surface, wherein said deflecting optical elements of said first set comprise reflecting elements tilted relative to one another, each element being associated with one row of said characters, and wherein said second set of said deflecting optical elements comprises reflecting elements tilted relative to one another, each element being associated with one column of said characters, so that each mirror element reflects only light from its respectively associated row or column.

4,107,703
FILM SENSITIVITY DETECTING FILTER ACTUATING CAMERA

Dieter Engelsmann, Unterhaching; Hubert Hackenberg, and Andreas Schubert, both of Munich, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed May 11, 1977, Ser. No. 795,942
Claims priority, application Fed. Rep. of Germany, May 14, 1976, 2621612
Int. Cl.[2] G03B *7/00, 17/26*
U.S. Cl. 354—21 **10 Claims**



1. In a camera of the type using film cassettes which are with or without markers depending upon the sensitivity of film in the respective cassette, a combination comprising a light-sensitive element; a light-diminishing component; a member carrying said component and being movable in a path between a first and a second position in which said component is respectively interposed in and withdrawn from the path of light impinging said element; means permanently urging said member towards said first position; and means for detecting the sensitivity of a film in a cassette inserted into the camera, including an arm

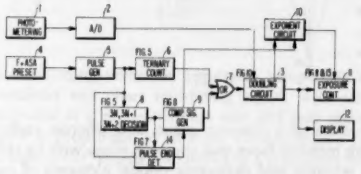
movable in a direction transverse to said path between one position in which a portion of said arm extends into said path and blocks movement of said member to said first position, and another position in which said portion is withdrawn from said path so that said member is free to move to said first position thereof.

4,107,704

CIRCUIT FOR DIGITALLY COMPUTING EXPOSURE CONTROL INFORMATION

Shigehisa Iwata, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jul. 29, 1976, Ser. No. 709,746
Claims priority, application Japan, Jul. 29, 1975, 50-92786
Int. Cl.[2] G03B 7/08
U.S. Cl. 354—23 D **9 Claims**



1. A circuit arrangement for digitally computing an exposure control information comprising:

means for generating a train of *n* pulses in number proportional to the quantity of a first information for exposure;

means for counting the pulses supplied from said pulse generating means;

means for generating a doubling operation pulse for each count of three pulses;

decision means for deciding to which of 3N+1, 3N+2 and 3N (where N stands for zero or a positive integer) the number *n* of said pulses corresponds;

means responsive to said decision means for generating, at the end of said pulse train, seven or four additional doubling operation pulses when said number of pulses corresponds to 3N+1 or 3N+2, respectively;

means for generating an exponential compensating signal according to the number of said pulses;

a register for storing a second information for exposure; and

doubling means for repeatedly doubling the information stored in said register as often as the sum of the number of doubling operation pulses generated by said doubling operation pulse generating means and the number of additional doubling operation pulses generated by said additional doubling operation pulse generating means.

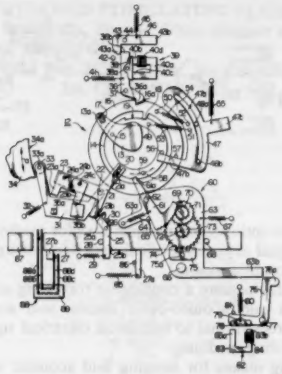
4,107,705

BLADED SHUTTER

Akihiko Hashimoto, and Fuzio Enomoto, both of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 4, 1976, Ser. No. 729,275
Claims priority, application Japan, Oct. 28, 1975, 50-147137[U]; Oct. 28, 1975, 50-147138[U]
Int. Cl.[2] G03B 7/14
U.S. Cl. 354—29 **6 Claims**

1. A bladed shutter for a camera including a plurality of shutter blades also serving as a diaphragm; a shutter opening ring and a shutter closing ring disposed in concentric manner with each other and being urged to rotate in the same direction, said rings cooperating with each other to pivotally support the plurality of shutter blades, the shutter blades being closed when said rings are in their starting position, being opened as the shutter opening ring precedes the shutter closing ring in movement and being closed again when both rings reach their terminal position; said shutter opening ring having a projection; first detent means movable between a first position wherein it locks said shutter opening ring in its initial position and a second position wherein it releases said shutter opening ring, said first detent means being urged into said first position prior to a shutter release operation, said first detent means being urged into said second position responsive to a shutter release operation; a governor movable between a first position lying out of the path of rotation of the projection on the shutter opening ring and a second position lying in the path of movement of the shutter opening ring, said governor being adapted to control the rate of rotation of the shutter opening ring; second detent means for selectively locking the shutter closing ring in its initial position; and shutter control means including a first photoelectric transducer element disposed within the camera to provide a photometry, the shutter control



means also including an electromagnet which maintains the second detent means in its locking position until a photometric value obtained by the first transducer element reaches a level corresponding to a proper exposure, whereupon the electromagnet releases the second detent means; characterized by the provision of a second photoelectric transducer element located externally of the camera, a governor control circuit including said second photoelectric transducer element, and a second electromagnet associated with the governor control circuit for displacing the governor away from the path of movement of the shutter opening ring in accordance with a photometric value obtained by the second photoelectric transducer element, thereby varying the degree of engagement between the governor and the shutter opening ring.

4,107,706

CAMERA APPARATUS

Hiroshi Ueda, Nara, and Kayoshi Tsujimoto, Osaka, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

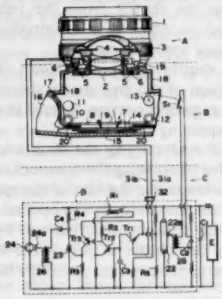
Continuation-in-part of Ser. No. 209,044, Dec. 17, 1971, Pat. No. 3,779,141. This application Dec. 17, 1973, Ser. No. 425,350
Claims priority, application Japan, Dec. 19, 1970, 45-113589; Feb. 6, 1971, 46-4917; Aug. 4, 1971, 46-58251
The portion of the term of this patent subsequent to Apr. 15, 1993, has been disclaimed.
Int. Cl.[2] G03B 7/08, 15/05, 11/00
U.S. Cl. 354—31 **23 Claims**

1. A barrel member adapted for exchangeable mounting to camera apparatus, comprising:

light receptive means mounted on said barrel member whereby said light receptive means is adapted to receive light reflected from the light sensitive surface of a film

when said barrel member is mounted to said camera apparatus;

a terminal mounted on said barrel member; and



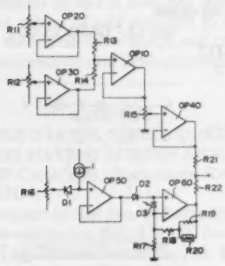
means for electrically connecting said light receptive means to said terminal.

4,107,707

ANALOGUE OPERATION ADJUSTING MEANS FOR PHOTOGRAPHIC CAMERA

Saburo Numata, and Shinichiro Okazaki, both of Urawa, Japan, assignors to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Mar. 7, 1977, Ser. No. 775,093
Claims priority, application Japan, Mar. 6, 1976, 51-24347
Int. Cl.[2] G03B *7/08*
U.S. Cl. 354—50 **8 Claims**



1. In an analogue type exposure control circuit built in a photographic camera including an analogue arithmetic unit in which a plurality of exposure information input means are connected with the input terminals of the arithmetic unit, an adjusting means for collectively compensating for all of errors due to the plurality of exposure information input means comprising a single additional adjustable information input means connected in parallel with at least one of said exposure information input means, said additional adjustable information input means being adjustable independently of the other exposure information input means.

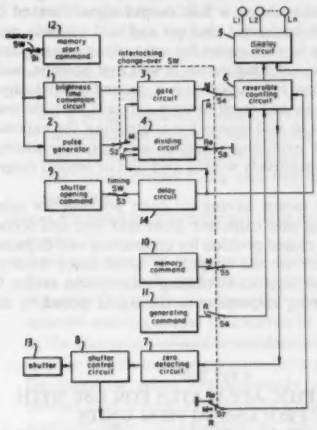
4,107,708

SHUTTER CONTROL CIRCUIT HAVING EXPOSURE TIME DISPLAY

Takeo Saito, and Youichi Seki, both of Chiba, Japan, assignors to Seiko Koki Kabushiki Kaisha, Japan

Continuation of Ser. No. 499,976, Aug. 23, 1974, abandoned.
This application Jun. 21, 1976, Ser. No. 698,062
Claims priority, application Japan, Aug. 24, 1973, 48-95004
Int. Cl.[2] G03B *7/00*
U.S. Cl. 354—60 L **2 Claims**

1. A shutter control circuit of the type having means for developing a plurality of pulses the number of which is representative of an exposure time; means for counting and storing said plurality of pulses and for reading-out the number of stored pulses in response to command signals, for controlling an exposure time; and means for applying a command signal to said means for counting and for reading-out to initiate reading-out of the stored pulses; wherein the improvement comprises:



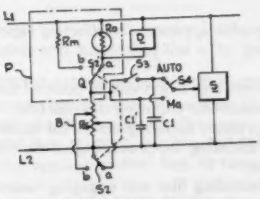
a display circuit, cooperative with said means for counting and storing, for visually displaying the exposure time represented by the number of pulses counted and stored; said display circuit comprising means, responsive to the command signal for initiating reading-out of the stored pulses, for disabling said display circuit thereby to reduce power consumption by said display circuit during exposure.

4,107,709

EXPOSURE TIME CONTROL CIRCUITRY FOR CAMERAS

Kayoshi Tsujimoto, and Akira Yoshizaki, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 645,424, Dec. 30, 1975, abandoned.
This application Jan. 26, 1977, Ser. No. 762,721
Claims priority, application Japan, Dec. 31, 1974, 50-1378
Int. Cl.[2] G03B *7/08*
U.S. Cl. 354—51 **20 Claims**



1. An exposure time control circuit for a camera adapted for manual and automatic exposure control, comprising:

a photoelectric element responsive to scene brightness;

a fixed resistor;

means for controlling the exposure;

a variable resistance element including a first and a second independently movable member for varying the resistance between the end terminals of said variable resistance element, said first movable member being at least movable in accordance with the setting of the film sensitivity and said

second movable member being movable in accordance with the manually set exposure time;

first switching means having a first position for connecting said first movable member to one of said end terminals and a second position to connect said second movable member to said one end terminal;

manually operable second switching means having a first position for connecting a first output signal formed between said photoelectric element and said variable resistance element to said means for controlling the exposure with said first switching means in said first position, and a second position for connecting a second output signal formed between said fixed resistor and said variable resistance element to said means for controlling the exposure with said first switching means in said second position;

a capacitor for selectively storing said first or second output; and

third switching means having an open position for selectively isolating said capacitor from said first and second outputs and a closed position for connecting said capacitor to said first or second outputs in accordance with the position of said second switching means, said means for controlling being responsive to the signal stored by said capacitor.

4,107,710

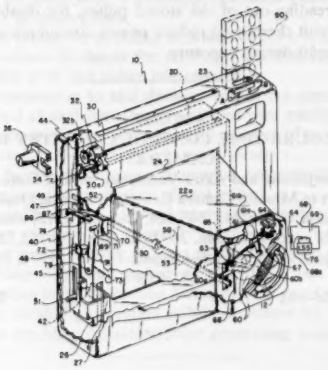
PHOTOGRAPHIC APPARATUS FOR USE WITH SELF-PROCESSING FILM UNITS

Donald M. Harvey, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 22, 1977, Ser. No. 780,149

Int. Cl.[2] G03B *17/50*

U.S. Cl. 354—86 **8 Claims**



1. Photographic apparatus for effecting exposure and initiating processing of a self-processing film unit, the apparatus comprising:

means for locating a film unit in position for exposure;

exposure means for exposing the film unit;

rotatable pressure applying means for receiving a film unit and for initiating the processing of the film unit after the exposure;

a shuttle including film unit engaging means for advancing the film unit from an exposure position to a position in which it may be received by the pressure applying means;

means for supporting the shuttle for pivotal and translational movement;

spring means for biasing the shuttle for pivotal and translational movement of the film unit engaging means in a direction away from said pressure applying means and towards a retracted position wherein the film unit engaging means is disposed to engage a film unit in its exposure position and is adapted upon movement of the shuttle to an advanced position to engage the film unit and to initiate advancement of the film unit towards the pressure applying means;

drive means including gear means for rotating the pressure applying means prior to receipt of a film unit therein and for translating the shuttle from the retracted position towards the advanced position to introduce the film unit into the pressure applying means;

a rack on the shuttle cooperating with the gear means whereby rotation of the gear means drives the shuttle so that the film engaging portion thereof is driven towards the pressure applying means;

restraint means for supporting the shuttle in the advanced position and for preventing the return of the shuttle to its retracted position under the bias of the spring means;

body release means actuatable by the operator of the apparatus for initiating exposure of a film unit by removing the restraint upon the shuttle to permit the shuttle to move towards the retracted position under the bias of the spring means; and

lever means pivotably and slidably coupled to the shuttle and responsive to the movement of the shuttle from the advanced position towards the retracted position and operatively associated with the exposure means for effecting commencement of the exposure of the film unit by the exposing means.

4,107,711

PHOTOGRAPHIC CAMERA FOR TAKING THREE DIMENSIONAL PHOTOGRAPHS AND METHOD AND APPARATUS FOR FORMING TRIVISION IMAGES

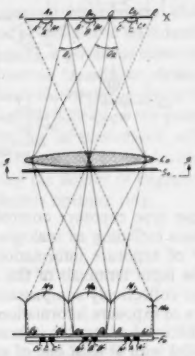
Chi Yin Law, No. 35-5, Koishikawa, 5-chome, Bunkyo-ku, Tokyo-to, Japan

Filed Mar. 24, 1976, Ser. No. 669,864

Claims priority, application Japan, Mar. 28, 1975, 50-37644; May 28, 1975, 50-64698

Int. Cl.[2] G03B *35/00*

U.S. Cl. 354—112 **30 Claims**



1. A photographic camera for three dimensional photography comprising:

means for positioning photosensitive material at a position for exposure;

a lenticular screen positioned for close contact with such positioned photosensitive material, the screen comprising a plurality of lenticular elements, the boundaries of adjacent elements forming lines which define stripe portions;

an objective for projecting an object image to be photographed through said lenticular screen onto such photosensitive material; and

a shutter comprising plate shaped shutter blades relatively movable between open and closed conditions during exposure and so positioned and defining, when open, an aperture gap which is elongated transversely of the stripe portions to allow projection of the object image to the

photosensitive material and, when closed, interrupts the projection,

the objective having an effective aperture defined by a pair of planes extending parallel to each other at opposite sides of a main optical axis and transversely to said stripe portions so that a single exposure by said shutter, when open, enables such object image to be projected on the photosensitive material as a reversed image;

the photosensitive material and the lenticular screen being maintained at a fixed position during the open condition of the shutter blades

23. A method for obtaining a three dimensional photographic image of an object comprising the steps of:

forming a photographic image comprising the steps of positioning a lenticular screen having predetermined optical characteristics adjacent to an exposure surface of a photosensitive material and in fixed relative position therewith during exposure;

projecting an object image through said screen and onto such surface to thereby expose and form a reversed three dimension image on said photosensitive material;

reversing the reversed image comprising the steps of positioning a lenticular screen, having substantially said predetermined characteristics, closely adjacent an original transparency carrying a developed form of the reversed three dimension image;

positioning a surface of fresh photosensitive material closely adjacent a surface of such original which is opposed from the lenticular screen;

projecting a beam of light through said lenticular screen and through said original to a surface of said fresh photosensitive material; and

while projecting, moving at least two of the following elements: said lenticular screen, said original, said fresh photosensitive material, and said beam of light, said movement being relative to said at least two elements and being relative to the others of said elements to thereby reverse the reversed three dimension image and create a non-reversed trivision image on said fresh photosensitive material.

4,107,712

CAMERA FOR TAKING THREE DIMENSIONAL PHOTOGRAPHS HAVING SCREEN MOVING MEANS

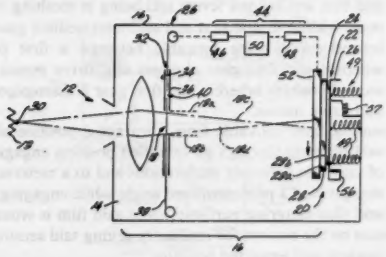
Chi Y. Law, 7845 Cambie St., Vancouver, British Columbia, Canada (V6P 3J1)

Continuation-in-part of Ser. No. 643,600, Dec. 22, 1975, abandoned. This application Feb. 3, 1977, Ser. No. 765,229

Claims priority, application Japan, Dec. 25, 1974, 49/148202

Int. Cl.[2] G03B *35/08*

U.S. Cl. 354—115 **14 Claims**



1. A photographic camera for three dimension photography comprising:

a housing having an opening to the interior for light rays;

means for immovably locating photosensitive material in communication with the interior of the housing at a location during a time for exposure;

optical means in said housing for projecting light rays, which are received through said opening from a scene to be photographed, along an optical path to said location, said path having a first position therealong extending transversely to the direction of the path from a first side to a second side of the path, the optical means comprising

a lenticular screen extending across said path at a second position farther along said path from the first position and having, on one side, a plurality of elongated lenticular elements of width P which face in the direction from which the light rays are being projected and having an opposite side facing and positioned for contact with the surface of such located photosensitive material,

the optical means being characterized in that it changes, by a predetermined distance Y, on such surface of the photosensitive material, the position of light rays which come from a substantially common point on such scene and which extend along said first and second sides of said path;

means for blocking the received light rays at said first position;

an aperture movable transversely across said path at said first position, from said first side to said second side, for exposing said light rays sequentially to the photosensitive material moving across said screen in a direction normal to the elongation of said lenticular elements; and

means for so moving said aperture for a predetermined time for exposure while simultaneously and synchronously moving said screen, substantially throughout said predetermined time for exposure, in substantially the same direction as the light rays sequentially expose said photosensitive material and over a distance substantially equal to the sum of P + Y to thereby expose a substantially continuous unreversed image of the scene on the photosensitive material, said means for moving comprising

means for moving said lenticular screen a predetermined distance along a path transverse to the path of the light simultaneously with the movement of said optical aperture and comprising

means for guiding said screen along said predetermined path,

a pivoted member,

means for connecting said pivoted member, at a position displaced from the pivot thereof, to said screen,

a rack connected to said pivoted member,

a pinion for engaging said rack,

a motor connected for rotatably driving said pinion to thereby move said rack and thereby pivot the pivoted member and move said screen along said predetermined path a precise predetermined amount corresponding to the driving movement of said motor.

4,107,713

FILM FEED MECHANISM FOR CAMERAS

Paul Greger, Braunschweig, Germany, assignor to Rollei-Werke Franke & Heidecke, Braunschweig, Germany

Filed Feb. 11, 1977, Ser. No. 767,776

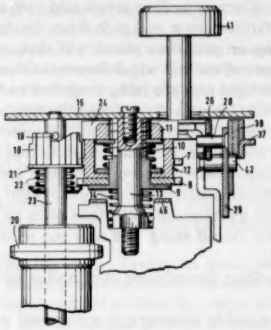
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1976, 2606131

Int. Cl.[2] G03B *19/02*

U.S. Cl. 354—209 **15 Claims**

1. A photographic camera comprising an operating lever movable to tension a shutter, a first gear operatively connected to and moved by said lever, film feeding means including a second gear meshing with said first gear and driven thereby to cause feeding of film concomitantly with tensioning the shutter, means including a manually operable element for shifting said second gear axially to unmesh it from said first gear so that said lever may be moved to tension said shutter without causing feeding of film, a camera release member operable to re-

lease said shutter to make an exposure, and means responsive to operation of said release member for restoring said second gear



to meshing relation to said first gear if said second gear has been unmeshed therefrom.

4,107,714

ADJUSTING MECHANISM FOR MOVABLE PICTURE-TAKING OBJECTIVE

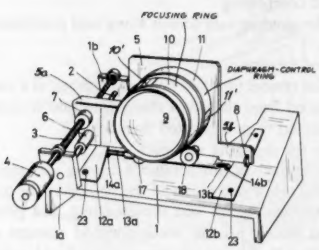
Karl-Heinz Raab, Bad Kreuznach, Fed. Rep. of Germany, assignor to Jos. Schneider & Co. Optische Werke, Bad Kreuznach, Fed. Rep. of Germany

Filed Mar. 19, 1976, Ser. No. 668,793

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1975, 2512424

Int. Cl.[2] G03B *3/00, 13/02*

U.S. Cl. 354—196 **9 Claims**



1. In a picture-taking apparatus comprising an objective displaceable between a fixed first plane and a fixed second plane for projecting an image of an object in said first plane with a variable magnification ratio upon said second plane, said objective being provided with an adjustable diaphragm and with at least one movable component for varying the focal length of said objective, the combination thereof with:

a base;

mounting means supporting said objective on said base, said mounting means being movable in a direction generally parallel to the optical axis of said objective;

a first setting member on said objective for adjusting said movable component;

a second setting member on said objective for adjusting said diaphragm;

first cam-follower means on said mounting means mechanically connected with said first setting member;

first cam means on said base engaged by said first cam-follower means for imparting a predetermined adjusting motion to said first setting member upon displacement of said mounting means on said base;

second cam-follower means mechanically connected with said second setting member; and

second cam means on said base engaged by said second cam-follower means for imparting a predetermined adjusting motion to said second setting member upon displacement of said mounting means on said base.

4,107,715

FILMSTRIP METERING DEVICE FOR A CAMERA

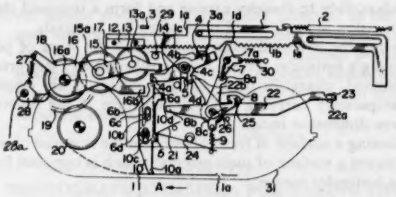
Harumi Tanaka, Kobe, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 716,232, Aug. 20, 1976, abandoned. This application Oct. 6, 1977, Ser. No. 839,814

Claims priority, application Japan, Aug. 21, 1975, 50-114328[U]

Int. Cl.[2] G03B *17/42*

U.S. Cl. 354—206 **11 Claims**



1. A camera in which a film cartridge may be inserted, the cartridge containing a filmstrip wound about a film wind-up gear and having a single filmstrip metering perforation on each frame thereof, the camera comprising:

a wind-up member mounted on the camera for movement between a rest and a winding position and having drive means thereon;

means resiliently urging the wind-up member toward its rest position;

transmission members for rotating the film wind-up gear on which the filmstrip is to be wound, said members including a rotatable first gear engageable with said drive means, a first lever pivotally mounted on said first gear, a wind-up engaging gear rotatable about a shaft mounted on the camera, said engaging gear being engageable with the film wind-up gear, a second lever being mounted on the camera for pivotal movement about said shaft, an intermediate gear mounted on said shaft for rotation together with said engaging gear, a second gear rotatably mounted on both said first and second levers and being in meshing engagement with both said first and said intermediate gears, said second lever being movable between a first position wherein said first gear engages said drive means and a second position wherein said first gear is disengaged from said drive means;

a sensing lever movable from a retracted position abutting said filmstrip through an extended position engaging one of said film metering perforations and to a metering position pivoted a predetermined angle while engaging one of said film metering perforations as said film is wound up;

means on the camera for resiliently urging said sensing lever toward said extended position;

a locking lever mounted on the camera for movement between a first position bearing against said second lever for locking it in its first position and a second position out of bearing engagement with said second lever for releasing it from its locked condition; and

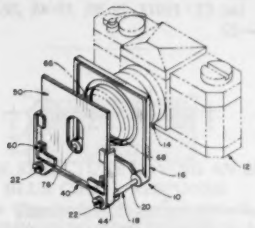
means on the camera for resiliently urging said locking lever toward its first position, said locking lever being operatively coupled with said sensing member so as to be moved to its second position when said sensing member reaches said metering position.

4,107,716

DEMOUNTABLE PHOTO VIGNETTING DEVICE

Irving Pfefer, 637 Anson St., Simi Valley, Calif. 93065

Filed Apr. 29, 1976, Ser. No. 681,532
Int. Cl.[2] G03B *11/00*
U.S. Cl. 354—296 7 Claims



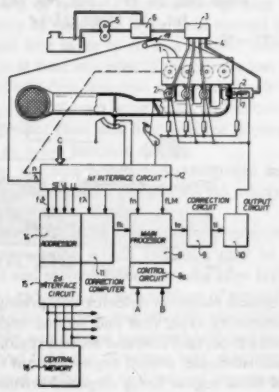
1. In a photo vignetting device for use in conjunction with a camera lens and mounted therefor while a photograph is being made, the combination of: a mounting plate having a centrally located circular opening coincident with and disposable adjacent said lens and adapted to receive securement means through said opening to secure said mounting plate to said lens mount adjacent said lens; track means having one end thereof mounted in said mounting plate; and a vignetting screen standard mounted for sliding movement on said track means, said vignetting screen standard having receptacle means therein for receiving said screen and including resilient track means sufficient to maintain said standard in a predetermined location on said track means but permitting intended movement thereupon.

4,107,717

METHOD AND APPARATUS FOR ADDRESSING A DIGITAL MEMORY

Winfried Klötzner, Schwieberdingen; Rolf Daumer, Merklingen; Wolfgang Busse, Hildesheim, and Hans-Christoph du Mont, Renningen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 17, 1976, Ser. No. 742,921
Claims priority, application Fed. Rep. of Germany, Nov. 18, 1975, 2551680
Int. Cl.[2] G06F *15/20;* F02D *5/00*
U.S. Cl. 364—431 25 Claims



1. A method for addressing a central memory for interrogation thereof and retrieval of data stored therein, said addressing taking place in dependence on the operational states of a system which is itself controlled by the data in said central memory, at least one of said operational states being dependent on another state, preferably the temperature of the system, and in particular adapted to controlling an electronic fuel injection system for generating a correction frequency by using the data retrieved from said central memory, for processing by a main processor and for generation of injection pulses to control the opening times of fuel injection valves of the engine, the improvement comprising:

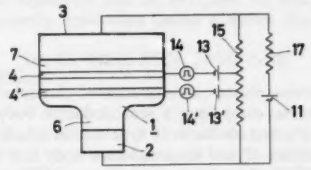
deriving switching signals from prevailing operational states of the system and feeding said switching signals to a decoder circuit, cyclically activating said decoder for generating a single pre-address selector signal corresponding to each combination of operational states, said pre-address selector signal being fed to an address memory for generating a digital address, a first part of which is fed directly to said main processor for selecting an address range and a second portion of which being fed to a counter which is thereby set to an initial value, gating said counter for a predetermined length of time, feeding to said counter a clock pulse train dependent on said operational state of the system, thereby causing said counter to count upwardly from its initial value, and delivering the final contents of said counter at the expiration of said gating time to said central memory for providing the complete address therein, and closing the gating input to said counter if a particular combination of operational states is independent of said other operational state.

4,107,718

BULK SEMICONDUCTOR LOGIC DEVICE

Shoei Kataoka, Tanashi; Nobuo Hashizume, Kawasaki, and Hiroshi Kodera, Kunitachi, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Continuation-in-part of Ser. No. 598,257, Jul. 23, 1975, abandoned. This application Apr. 5, 1977, Ser. No. 784,697
Claims priority, application Japan, Jul. 24, 1974, 49-84247
Int. Cl.[2] H01L *27/26*
U.S. Cl. 357—3 12 Claims



1. A bulk semiconductor logic device comprising

a bulk semiconductor body, said semiconductor body exhibiting negative conductivity under high electric field, said semiconductor body having bias electric field applying cathode and anode electrodes at opposite ends thereof, respectively, a portion of said semiconductor body having a lower electric field than that of other portions,

at least two signal electrodes of field effect type in said low field portion thereof, said signal electrodes of field effect type being of a nature to form a depletion layer in said semiconductor body thereunder when a voltage negative with respect to said semiconductor body thereunder is applied thereto,

means for applying bias voltage to said at least two signal electrodes, said bias voltage being of negative polarity with respect to the potential of the semiconductor body thereunder,

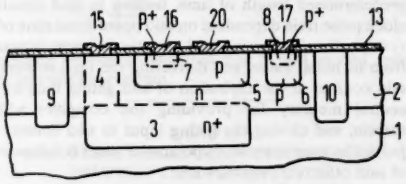
means for applying a signal voltage to each said signal electrode, and

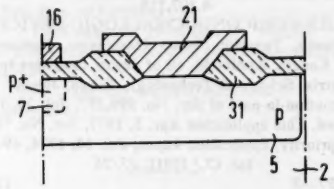
means for detecting the presence of a high electric field domain in said semiconductor body.

4,107,719
INVERSE PLANAR TRANSISTOR

Juergen Graul, Gruenwald, and Helmut Murrmann, Ottobrunn, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Continuation-in-part of Ser. No. 656,940, Feb. 10, 1976, abandoned. This application Dec. 10, 1976, Ser. No. 749,438
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1975, 2507148
Int. Cl.[2] H01L *29/48*
U.S. Cl. 357—15 3 Claims



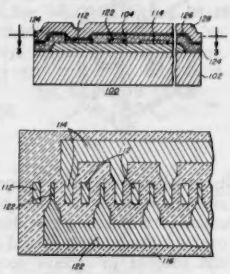


1. An inverse planar transistor adapted particularly for integrated circuits, comprising a semiconductor body having a first zone of a first conductivity type therein which extends to a planar surface of said semiconductor body and which provides a base zone for said transistor, a second zone in said body of the opposite conductivity type located on the opposite side of said base zone from that side which lies in said planar surface, said second zone being interfaced with said base zone and forming a PN junction, a relatively highly doped third zone of said second conductivity type in said body on the opposite side of said second zone from said base zone and interfaced with said second zone, a highly doped fourth zone of said second conductivity type extending from said planar surface to said third zone leading along side of and spaced from said base zone, said fourth zone providing a conductive path to said third zone, an insulating layer overlying the planar surface of said semiconductor body, and a Schottky contact forming a collector on the planar surface of said base zone, said Schottky contact having a guard ring underlying a marginal edge of said Schottky contact, said guard ring being formed as a relatively thick portion of said insulating layer surrounding the opening through which said Schottky contact extends into contact with said base zone as compared with the remaining portion of said insulating layer, the doping concentration of said base zone in the region of said Schottky contact being $\leqq 10^{17}$ /cm^3, the metal electrode of said Schottky contact being a metal from the group consisting of Pd, Pt and Al.

4,107,720
OVERLAY METALLIZATION MULTI-CHANNEL HIGH FREQUENCY FIELD EFFECT TRANSISTOR

Robert A. Pucel, Needham, and James A. Benjamin, Boxford, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 518,692, Oct. 29, 1974, abandoned. This application Apr. 19, 1976, Ser. No. 678,509
Int. Cl.[2] H01L *29/80, 29/48, 29/56*
U.S. Cl. 357—22 30 Claims

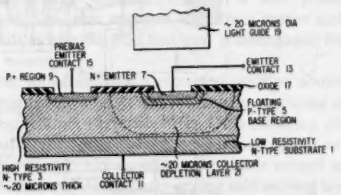


1. A field effect transistor device comprising in combination:
a transistor body;
an epitaxial layer upon one surface of said transistor body;
a plurality of contacts, each one of said contacts being disposed upon one surface of said epitaxial layer, a plurality of controlled conductive channels being formed between predetermined ones of said contacts;
first and second conductive layers coupled to and interconnecting contacts coupled to like ones of said contacts, said contacts being adjacent to said surface;
a layer of insulating material covering at least a portion of said first and second conductive layers, said insulating material having a plurality of apertures therein; and
a third conductive layer coupled to and interconnecting contacts coupled to a third type of said contacts, said third conductive layer extending through said aperture.

4,107,721
PHOTOTRANSISTOR

Gabriel Lorimer Miller, Westfield, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 26, 1977, Ser. No. 762,675
Int. Cl.[2] H01L *27/14*
U.S. Cl. 357—30 4 Claims



1. An optical radiation detector comprising a substrate of a first conductivity type, first and second regions of a second conductivity type, said first and second regions being disposed within said substrate, a third region of said first conductivity type, said third region being disposed within said second region, said third, second and first regions being called the emitter, base and prebias emitter regions, respectively, said substrate being called the collector region, said collector region having a light sensitive depletion layer when reverse biased, said emitter having an exposed surface providing an optical

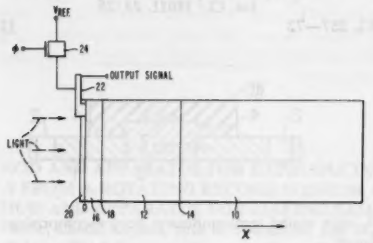
radiation receiving surface, means for prebiasing said base region; characterized in that said means for prebiasing said base region comprises said prebias emitter in said collector region spaced from said light sensitive depletion layer, said prebias emitter being a current source for supplying a current to said base.

4,107,722

PHOTODIODE STRUCTURE HAVING AN ENHANCED BLUE COLOR RESPONSE

Savvas Georgiou Chamberlain, Waterloo, Canada, assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 717,052, Aug. 23, 1976, abandoned.
This application Nov. 25, 1977, Ser. No. 854,877
Int. Cl.[2] H01L *27/14*
U.S. Cl. 357—30 6 Claims



1. A photodiode device for radiation responsive image detectors comprising:

a semiconductor substrate of a *p* conductivity type,

a first layer of material having a first selected doping density of n-type conductivity, said first layer disposed on said substrate to form a first n-p junction at a first depth,

said first selected doping density of said first layer being a relatively low doping density,

and a second layer of material having a second selected doping density of n-type conductivity greater than the doping density of said first layer, said second layer disposed on said first layer to form a second junction at a second depth at least an order of magnitude less than said first depth of said first junction, said second selected doping density of said second layer being within one order of magnitude greater than said first selected doping density resulting in an n-n-p junction device,

wherein said first junction is relatively deep and has a relatively low doping density with respect to said relatively shallow, higher doping density second junction,

said second layer having an outer surface opposite to said second junction upon which radiation may be directed and said first and second n-conductivity type layers being responsive to radiation on said surface of second layer to produce minority carriers and wherein said doping densities of said first and second layers are selected for producing an electric field for directing said minority carriers away from said surface of said second layer and toward said first n-p junction,

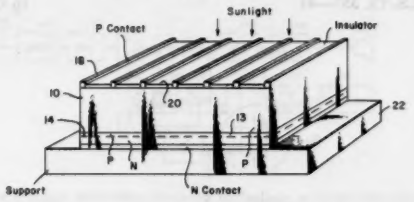
said second junction functioning to screen said minority carriers from said surface of said second layer and to permit said relatively low doping density in said first layer to maintain the lifetime of said minority carriers.

4,107,723

HIGH BANDGAP WINDOW LAYER FOR GaAs SOLAR CELLS AND FABRICATION PROCESS THEREFOR

G. Sanjiv Kamath, Malibu, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed May 2, 1977, Ser. No. 792,840
Int. Cl.[2] H01L *27/14*
U.S. Cl. 357—30 6 Claims



4. A PN junction semiconductor device including:

a. a gallium-free P-type substrate layer selected from the group of materials consisting of aluminum phosphide antimonide, aluminum arsenide, aluminum indium phosphide, aluminum nitride and boron nitride, and

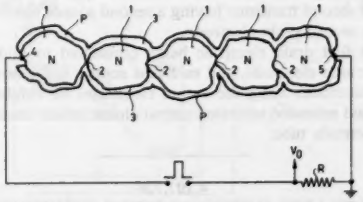
b. a thin layer of N-type gallium arsenide disposed on said substrate layer and having a PN junction therein, whereby said device requires a minimum amount of gallium in its fabrication, and solar cells, light emitting diodes, laser diodes and other PN junction devices may be formed as PN junction structures utilizing a minimum of gallium.

4,107,724

SURFACE CONTROLLED FIELD EFFECT SOLID STATE DEVICE

John Ernest Ralph, Crawley Down, England, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 639,280, Dec. 10, 1975, abandoned.
This application Jun. 28, 1977, Ser. No. 810,666
Claims priority, application United Kingdom, Dec. 17, 1974, 54484/74
Int. Cl.[2] H01L *27/14, 31/00, 29/80*
U.S. Cl. 357—30 20 Claims

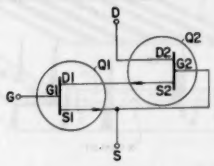


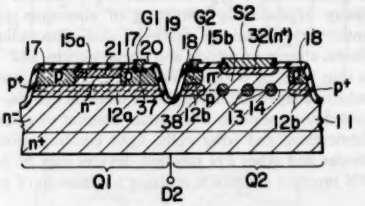
1. An electronic solid state device comprising an inhomogeneous body including a plurality of grains of semiconductor material, said grains positioned so as to adjoin each other to provide continuity of electrical conduction paths between the bulk material of adjoining grains, the dominant current conduction paths in said body passing through the interface regions between adjacent grains at grain to grain contacts, charge storage enabling means formed within said body at the surfaces of said grains at least locally adjoining but not interrupting said interface regions, and means contacting said charge storage enabling means for enabling the control of electrical conductivity of at least a portion of said body by surface field effect depletion of said conduction paths between adjoining grains in said interface region.

4,107,725
COMPOUND FIELD EFFECT TRANSISTOR

Takashi Yoshida, and Takeshi Matsuyama, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jul. 30, 1975, Ser. No. 600,476
Claims priority, application Japan, Aug. 2, 1974, 49/88688; Aug. 21, 1974, 49/95896
Int. Cl.² H01L *27/02*
U.S. Cl. 357—41 16 Claims





1. A compound field effect transistor having an output characteristic resembling that of a pentode vacuum tube comprising:

a first junction-type field effect transistor having a saturated drain current to drain voltage characteristic and having a first gate electrode for receiving an input signal, a first source electrode and a first drain electrode,

means comprising a second junction-type field effect transistor having an unsaturating drain current to drain voltage characteristic for extending the drain-current-saturated operating drain voltage range of said compound transistor and for improving the equality of the intervals between the characteristic curves of said compound transistor,

said second transistor having a second source electrode and a second drain electrode,

said first drain electrode being connected to said second source electrode, and said first source and second drain electrodes being the output electrodes for exhibiting the said extended saturated output characteristic resembling a pentode tube.

4,107,726
MULTILAYER INTERCONNECTED STRUCTURE FOR SEMICONDUCTOR INTEGRATED CIRCUIT

Hartmut Schilling, Boxboro, Mass., assignor to Raytheon Company, Lexington, Mass.

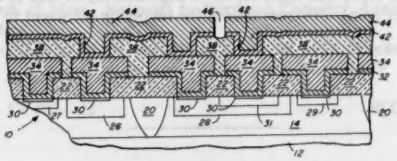
Filed Jan. 3, 1977, Ser. No. 756,508
Int. Cl.² H01L *23/48, 29/46, 29/54*
U.S. Cl. 357—71 4 Claims

1. A semiconductor integrated circuit structure comprising:

(a) a first aluminum lead metal interconnecting system formed over a surface of a semiconductor body of such circuit;

(b) an insulating layer on the first lead metal interconnecting layer, such insulating layer having apertures formed in selected regions thereof;

(c) a refractory metal layer deposited on the insulating layer and through the apertures onto selected regions of the first lead metal interconnecting system; and

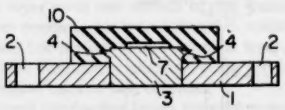


(d) a second aluminum lead metal deposited directly on the refractory metal layer to form a second interconnecting layer.

4,107,727
RESIN SEALED SEMICONDUCTOR DEVICE

Ryuichi Ikezawa; Atsushi Sasayama, both of Takasaki, and Sakae Kikuchi, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 26, 1977, Ser. No. 819,053
Claims priority, application Japan, Jul. 28, 1976, 51-89112
Int. Cl.² H01L *23/28*
U.S. Cl. 357—72 12 Claims



1. A resin sealed semiconductor device comprising:

a flange;

a heat sink mounted at the center of said flange, said heat sink protruding from a top surface of said flange;

a semiconductor pellet fixed on said heat sink;

leads electrically connected to electrodes of said semiconductor pellet through wires;

a resin mold on said flange for surrounding and sealing said semiconductor pellet fixed on said heat sink and inner ends of said leads; and

a projection formed around an outer periphery at the protruding portion of said heat sink.

4,107,728
PACKAGE FOR PUSH-PULL SEMICONDUCTOR DEVICES

Lee B. Max, Sunnyvale, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Jan. 7, 1977, Ser. No. 757,716
Int. Cl.² H01L *39/02, 23/02, 23/12*
U.S. Cl. 357—80 31 Claims

1. A package for semiconductor devices comprising:

a first dielectric member;

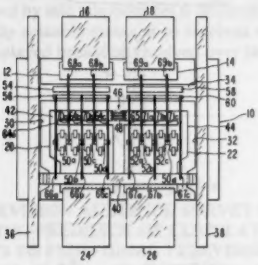
a pair of mutually electrically isolated input areas on said first member comprised of a first conductive input area and a second conductive input area adjacent said first input area;

a pair of mutually electrically isolated output areas on said first member comprised of a first conductive output area and a second conductive output area adjacent said first output area:

a second dielectric member;

a common ground plane on said second member substantially parallel to said pairs of input and output areas such that each of said first and second input areas and each of said first and second output areas cooperate with said ground plane to form a structure for packaging first and

second active semiconductor devices to thereby provide first and second discrete paths for the transfer of energy at high frequency from input to output over each of said



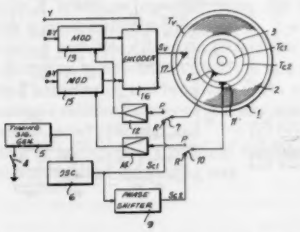
paths and further including first and second active semiconductor devices connected, respectively, between said first input area and said first output area, and between said second input area and said second output area.

4,107,729

METHOD AND APPARATUS FOR REPRODUCING SIGNALS FROM A ROTATING RECORD MEDIUM AND METHOD AND APPARATUS FOR MAKING SAME

Takashi Otobe; Chiaki Kojima, both of Yokohama, and Hiroshi Ohki, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 16, 1976, Ser. No. 751,179
Claims priority, application Japan, Dec. 23, 1975, 50-154391
Int. Cl.[2] H04N *5/76*
U.S. Cl. 358—4 **16 Claims**



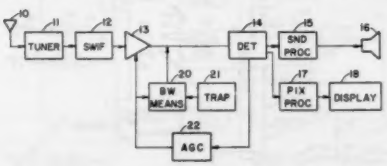
1. A method of recovering information from a record medium wherein said information is a color television signal and is modulated and recorded in an information track on one portion of said record medium and a reference carrier is recorded on another portion of said record medium, said reference carrier comprising first and second reference carriers recorded on first and second reference tracks, respectively, said method comprising the steps of rotating said record medium; reproducing said modulated information from said one portion of said record medium; simultaneously reproducing said reference carrier from said other portion of said record medium; and demodulating said reproduced modulated information with said reproduced reference carrier by separating the reproduced color television signal into luminance and chrominance components, and demodulating said chrominance components with the reproduced first and second reference carriers.

4,107,730

SIGNAL STRENGTH RESPONSIVE SOUND TRAP

Gary A. Jones, Arlington Heights, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Mar. 2, 1977, Ser. No. 773,722
Int. Cl.[2] H04N *9/535*
U.S. Cl. 358—37 **2 Claims**



1. In a color television reciever including; a tuner developing an intermediate frequency picture carrier and an intermediate frequency sound carrier from a received color television signal; an IF amplifier system including a variable gain amplifier and a surface wave integratable acoustic filter; AGC means; picture carrier enhancement means including a transistor; synchronous detector means, said synchronous detector means requiring sound carrier trapping in the presence of abnormally strong signals to preclude generation of a 920KHz sound-chrominance interference beat; said AGC means controlling said variable gain amplifier and conduction of said transistor in said picture carrier enhancement means to sharpen receiver response to the picture carrier under weak signal conditions, the improvement comprising:

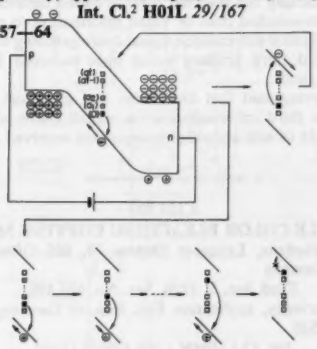
an absorption trap tuned to the frequency of the sound carrier in circuit with said transistor such that for said abnormally strong signals, said trap is fully effective and precludes generation of said 920KHz beat and for weak signals said trap is ineffective and sound carrier amplitude is maintained.

4,107,731

SILICON DOPED WITH CADMIUM TO REDUCE LIFETIME

Masayoshi Naito, and Tatsuya Kamei, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 19, 1976, Ser. No. 668,400
Claims priority, application Japan, Mar. 24, 1975, 50-34370
Int. Cl.[2] H01L *29/167*
U.S. Cl. 357—64 **1 Claim**

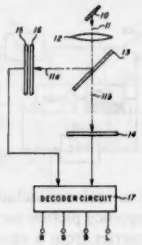


1. A semiconductor device comprising a silicon semiconductor body having a first layer of N type conductivity and a second layer of P type conductivity adjacent to said first layer so as to form a PN junction between said first and second layers, said second layer having a higher resistivity than that of the first layer, and said second layer being doped with cadmium for imparting a short reverse recovery time of the PN junction to the device.

4,107,732
TWO SENSOR TIME ENCODED COLOR IMAGING SYSTEM

Willis A. Adcock, and Frank L. Skaggs, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 28, 1976, Ser. No. 700,359
Int. Cl.[2] H04N 9/07
U.S. Cl. 358—43 28 Claims



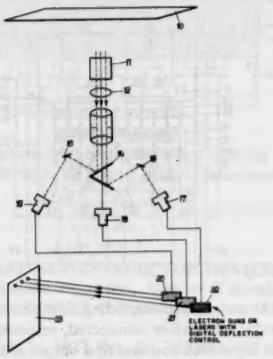
1. A method producing three color-information signals representative of the shape and color of light received from an object, said method comprising:
(a) splitting the light from the object into first and second portions, the first portion comprising light of a first primary color and the second portion comprising light of second and third primary colors;
(b) encoding the first portion into a first color-information signal using a first charge coupled device image sensor, said first color signal corresponding to the light of said first primary color from said object;
(c) spatially filtering out light of said third primary color from said second portion using a striped optical filter;
(d) encoding the spatially filtered second portion into an electrical signal using a second charge-coupled device image sensor, said electrical signal comprising alternating first and second lines of video information, said first lines corresponding to the light of said second and third primary colors received from said object and said second lines corresponding to light of said second primary color received from said object;
(e) storing a selected one of said first and second lines of video information;
(f) substracting the selected lines of video information and the non-selected lines of video information to produce a second color-information signal corresponding to the light and said third primary color light received from said object; and
(g) removing said first lines from said electrical signal to form a third color-information signal, corresponding to the light of said second primary color received from said object.

4,107,733
FACSIMILE COLOR BLEACHING COPYING METHOD

Willi Schickedanz, Langener Strasse 70, 605 Offenbach am Main, Germany

Filed Jan. 5, 1976, Ser. No. 646,498
Claims priority, application Fed. Rep. of Germany, Jan. 8, 1975, 2500520
Int. Cl.[2] H04N 1/46; G01D 15/10
U.S. Cl. 358—75 7 Claims

1. A method of making copies, comprising the following steps:
(a) dividing the pattern, which is to be copied, simultaneously into its components of colour;
(b) scanning the components of colour simultaneously point by point and converting the intensities of the coloured points into control signals;
(c) leading the control signals to electromagnetic sources, the beams of which are deflectable and the intensities of the beams being correspondent to the intensity of the control signals;
(d) bleaching the intensity of the components of colour in a special copy paper, wherein the colour components are

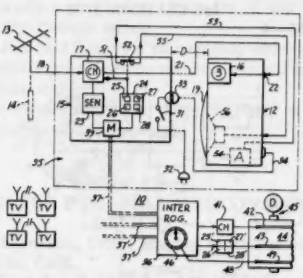


arranged by points which lie side-by-side, the bleaching of a certain area of the copy paper corresponding to the inverse intensity of colours in the corresponding area of the pattern.

4,107,734
TELEVISION VIEWER REACTION DETERMINING SYSTEM

Roger D. Percy; David C. M. Wilding, both of Seattle, Wash., and Sholly Kagan, Boston, Mass., assignors to R. D. Percy & Company, Seattle, Wash.

Filed Jan. 31, 1977, Ser. No. 763,966
Int. Cl.[2] H04H 1/44
U.S. Cl. 358—84 20 Claims



1. In a system for determining viewing habits of television viewers in a multi-channel television broadcast reception area including a television broadcast display set, the improvement comprising in combination:
a remote control for said television set including first manually actuable means located at a distance from said television set for causing said television set to display a television broadcast received on any one of a predetermined number of channels, and further manually actuable means adjacent said first manually actuable means for receiving a television viewer reaction to displayed television broadcasts;
means coupled to said further manually actuable means and to at least one of said first manually actuable means and television broadcast display set for altering the display of a television broadcast in response to a received television viewer reaction;
means coupled to said first manually actuable means for

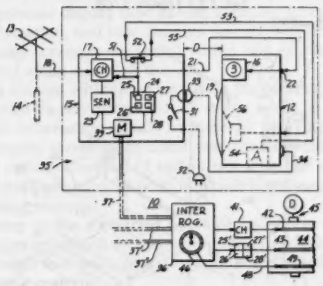
determining for each broadcast displayed by said television set the channel on which that broadcast is being received; and

means connected to said determining means and coupled to said further manually actuable means for polling said determining means as to the channel on which a broadcast displayed by said television set is received and said further manually actuable means as to received viewer reactions to a displayed broadcast received over the latter channel.

4,107,735
TELEVISION AUDIENCE SURVEY SYSTEM PROVIDING FEEDBACK OF CUMULATIVE SURVEY RESULTS TO INDIVIDUAL TELEVISION VIEWERS

Hugh F. Frohbach, Sunnyvale, Calif., assignor to R. D. Percy & Company, Seattle, Wash.

Filed Apr. 19, 1977, Ser. No. 788,719
Int. Cl.[2] H04M 7/02
U.S. Cl. 358—84 **49 Claims**



1. In a method of determining the reaction of television viewers to a video program displayed by different video display sets in a broadcast reception area, the improvements comprising in combination the steps of:

broadcasting said video program to said sets for display at the discretion of television viewers in said area;

providing a display of said broadcast video program;

determining a relative number of said sets responding to said broadcast video program; and

providing in said display a pictorial representation of said relative number of responding sets.

4,107,736
NOISE REDUCTION SYSTEM FOR VIDEO SIGNALS

John D. Lowry, Willowdale, Canada, and Kenneth F. Holland, Granada Hills, Calif., assignors to Image Transform, Inc., Los Angeles, Calif.

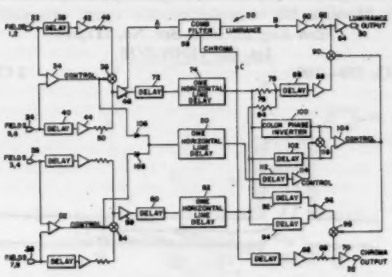
Filed Dec. 20, 1971, Ser. No. 209,910
Int. Cl.[2] H04N 5/14
U.S. Cl. 358—36 **17 Claims**

15. A method of improving the quality of a video picture, comprising the steps of:

(a) electronically comparing corresponding portions of at least two separate frames of the video picture having the same phase, the first of said frames being the n^{th} frame of said video picture;

(b) using the result of said comparison to combine said corresponding portions;

(c) transmitting said combination of said portions; and

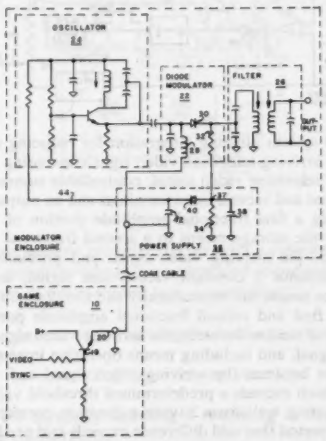


(d) repeating said comparison, combination, and transmission with said first frame being, successively, the $(n+1)^{th}$, $(n+2)^{th}$, etc. frame of said video picture.

4,107,737
SYNCHRONIZATION SIGNAL POWERED TELEVISION TRANSMITTER

James W. Maben, Brookline, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Jan. 24, 1977, Ser. No. 761,735
Int. Cl.[2] H04N 7/18; A63B 71/04
U.S. Cl. 358—93 **11 Claims**



1. Apparatus for generating d.c. power at an electrical circuit requiring said d.c. power and remotely located from a source of synchronization signals, comprising:

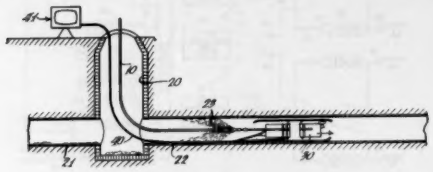
means coupled to the source of synchronization signals for generating substantially d.c. power from said synchronization signals; and

means coupling said means for generating substantially d.c. power to the electrical circuit.

4,107,738
SEWER INSPECTION DEVICE AND METHOD OF SCANNING SEWERS FOR LEAKS

John W. Van Norman, Kansas City, Kans., assignor to Conco Inc., Mendota, Ill.

Filed Aug. 25, 1976, Ser. No. 717,544
Int. Cl.[2] H04N 7/18
U.S. Cl. 358—100 3 Claims

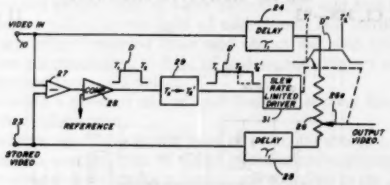


1. A TV sewer inspection device including an aboveground receiver and a skid-mounted camera for movement along a sewer, and hydraulic jet propulsion means including a jet unit associated with said camera for advancing the camera along the sewer and further comprising a power-operated drum having a pressure hose mounted thereon which is connected to said jet unit for supplying fluid to the jet unit and for retraction thereof by windup of the pressure hose.

4,107,739
SYSTEM UTILIZING INTEGRATION AND MOTION EVALUATION FOR REDUCING NOISE IN VIDEO SIGNAL

John P. Rossi, New York, N.Y., and Marvin A. Stern, Stamford, Conn., assignors to CBS Inc., New York, N.Y.

Filed Aug. 22, 1977, Ser. No. 826,292
Int. Cl.[2] H04N 9/535, 5/21
U.S. Cl. 358—167 2 Claims



1. In a system utilizing integration for reducing noise contained in arriving television video signals including means for storing a television video signal, controllable summing means having first and second input terminals and an output terminal for adding a first fractional amplitude portion of the signal stored in the storage means to a second fractional amplitude portion of the arriving video signal and producing at said output terminal a constant valued sum signal, and motion evaluation means for automatically and simultaneously changing said first and second fractional amplitude portions as a function of motion between the arriving video signal and the stored signal, and including means operative in response to a difference between the arriving video signal and the stored signal which exceeds a predetermined threshold value to generate a gating waveform having a duration corresponding to the time period that said difference exceeds said predetermined threshold value, and means for causing said controllable summing means to increase, during the existence of the gating waveform, the fractional amplitude portion of the arriving video signal and to decrease the fractional amplitude portion of the stored signal contained in the sum signal produced at said output terminal, the improvement in said motion evaluation means which comprises:

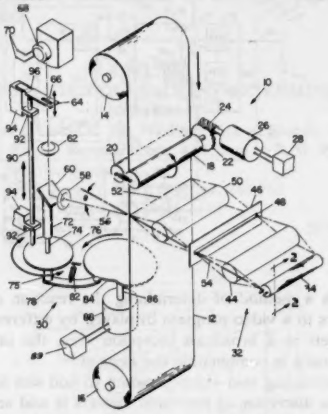
first and second signal coupling means for coupling said arriving video signal and said stored signal to the first and second input terminals, respectively, of said controllable summing means, said first and second coupling means each including means for delaying its coupled signal by a predetermined amount sufficient to cause the start of said gating waveform to be anticipatory of the delayed arriving video signal and delayed stored signal, and

means for delaying by a predetermined amount the termination of said gating waveform thereby to produce an extended gating waveform and applying said extended gating waveform to said causing means, said extended gating waveform delaying a change to a decreased value of the fractional amplitude portion of the arriving video signal from that which existed during the gating waveform.

4,107,740
OPTICAL SCANNING SYSTEM UTILIZING AN OSCILLATING LENS AND MIRROR

Austin G. Cooley, 690 W. Second St., Reno, Nev. 89503

Continuation-in-part of Ser. No. 479,205, Jun. 14, 1974, Pat. No. 3,988,537. This application Feb. 2, 1976, Ser. No. 654,192
Int. Cl.[2] H04N 3/08
U.S. Cl. 358—293 3 Claims



1. An optical scanning system for the high-speed scanning of a sheet which system is at all times symmetrical to its optical axis, comprising:

a lens and mirror mounted upon a common frame;

a second lens;

said mirror arranged to reflect light from said sheet focused by said first-mentioned lens upon said second lens to establish said optical axis;

means for oscillating said lens and mirror mounting frame for sweeping the focus of said first-mentioned lens across said sheet onto said mirror;

electro-optical means mounted in said optical axis for receiving light reflected from said oscillating mirror focused thereon by said second lens;

an aperture plate having an aperture therein mounted between said second lens and said electro-optical means;

means for oscillating said aperture plate back and forth in a direction parallel to said optical axis; and

said second lens focused upon said oscillating aperture for retaining said light reflected by said mirror in focus on said aperture as said first-mentioned lens focus sweeps across said sheet.

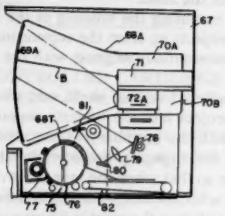
4,107,741
DATA GENERATING AND RECORDING SYSTEM FOR SCANNING A DISPLAY TUBE SCREEN

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Continuation-in-part of Ser. No. 333,119, Feb. 16, 1973, Pat. No. 3,872,462. This application Mar. 17, 1975, Ser. No. 559,087

Int. Cl.[2] H04N 5/80

U.S. Cl. 358—300 6 Claims



1. An apparatus for recording images generated on the display screen of an electronic display tube comprising in combination:

an electronic display tube having a display screen for image information, said tube defining an enclosed envelope, said display screen being sealed within said envelope and disposed along one wall thereof,

means located within said enclosure for generating an image on said display screen which image varies in accordance with information signals received by said display tube,

said display screen being constructed and operable to permit the optical scanning of said screen from the rear thereof,

said tube having a wall portion which is made of light transmitting material,

scanning means supported operable to receive light of the images generated on said screen after said light has passed through said wall portion of said tube made of light transmitting material,

means for operating said scanning means to cause it to predeterminately scan the image presented on the rear of said screen of said display tube, and

recording means operable to receive the light received by said scanning means in scanning said rear of said display screen and to effect a hard copy recording thereof.

4,107,742
METHOD AND APPARATUS FOR RECORDING GRAPHIC INFORMATION MAGNETICALLY

Sidney Levy, 145 W. Cuthbert Blvd., Oaklyn, N.J. 08107

Filed May 30, 1975, Ser. No. 582,124

Int. Cl.[2] H04N 1/28

U.S. Cl. 358—301 27 Claims

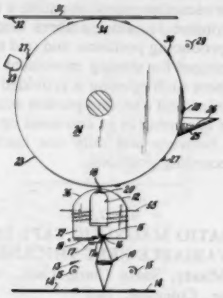
1. An imaging apparatus for recording graphic information from an original onto a receiving surface, comprising:

(a) means for providing a magnetic field;

(b) means for shaping the magnetic field to a substantially linear configuration to provide a line with a uniform magnetic intensity throughout its length for any instant of time; said shaping means including a copying head having a plurality of electrically conductive and magnetically permeable laminae electrically insulated from each other to define a stack of said laminae having a first terminal and a second terminal, each of said laminae having a gap therein between said terminals bridged by an electrically conductive and non-magnetic material, said line being disposed along said gap;

(c) electrical means connected to said first and second terminals for varying the intensity of portions of the magnetic field along said line to provide magnetic information in accordance with information contained on a corresponding portion of the original graphic information; and

(d) surface means positioned adjacent to said gap in magnetic coupling relation to said linear configuration of said magnetic field for recording thereon the magnetic information contained along said line and for producing thereon a magnetic image corresponding to the original graphic information, said surface means further attracting thereto a toner material and transferring the toner material to a receiving surface in quantity corresponding to variations of light and shade in the original as provided by magnetic field intensity variations along said line.



4,107,743
CASSETTE RECORDER WITH ANTI-ERASE INTERLOCK

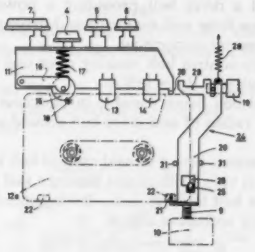
Gilbert Edouard Mestdagh, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 13, 1977, Ser. No. 787,028

Claims priority, application Netherlands, May 6, 1976, 7604825

Int. Cl.[2] G11B 15/04, 21/04

U.S. Cl. 360—60 6 Claims



1. A tape cassette recorder for use with a cassette of a type in which anti-erase openings are provided to prevent inadvertent erasure of pre-recorded tape, comprising:

a housing,

means mounted to the housing for holding a cassette in the recorder,

means for controlling tape driving functions of said recorder,

means for manually selecting a recording or reproducing mode of operation,

means for recording and playing back information on tape in a cassette held in the recorder, in response to selection of the recording or playback mode of operation,

means for sensing presence of an anti-erase opening in a cassette held in the recorder, and

means for blocking manual selection of the recording mode responsive to sensing presence of an anti-erase opening;

wherein said means for manually selecting and said means for sensing consist of a single rigid combined recording

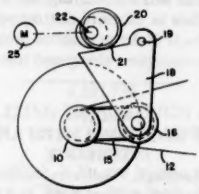
member, means for mounting said member for movement relative to the housing and a cassette in the recorder between a recording position and at least one inactive reproducing position, and means for switching the recorder to a recording condition responsive to said member being in the recording position and to a reproducing condition responsive to said members being in one of the inactive reproducing positions; and said member has a first portion arranged for sensing movement into an anti-erase opening where such opening is provided in a cassette held in the recorder, and a second portion accessible, at least in the absence of sensing of an anti-erase opening, for manual movement between said only one inactive reproducing and said recording positions.

4,107,744

VARIABLE RATIO MAGNETIC TAPE DRIVE USING A VARIABLE BELT THICKNESS

Alexander R. Maxey, Santa Clara, Calif., assignor to Arvin Industries, Inc., Columbus, Ind.

Filed Oct. 5, 1976, Ser. No. 729,672
Int. Cl.[2] G11B *15/28, 15/46, 19/28*
U.S. Cl. 360—73 **9 Claims**



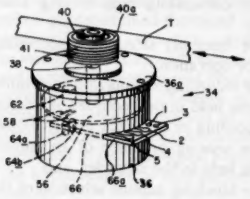
1. In a recorder having
means defining a path for the recording media,
drive means for advancing the media along said path including a drive motor,
pulleys and a drive belt providing a power transmitting connection from said motor to said drive means;
the improvement comprising
a drive ratio control belt running over one of said pulleys underneath said drive belt,
said control belt being variable in thickness to change the effective radius of said drive belt around said one pulley, and
tensioning means acting on said control belt to stretch it and thereby to vary its thickness between said one pulley and said drive belt to control the driving speed ratio between said motor and drive means.

4,107,745

TAPE SPEED CONTROL APPARATUS

Edward F. Burke, Jr., Reading, Mass., assignor to MFE Corporation, Salem, N.H.

Filed Apr. 6, 1977, Ser. No. 785,021
Int. Cl.[2] G11B *5/00*
U.S. Cl. 360—73 **4 Claims**



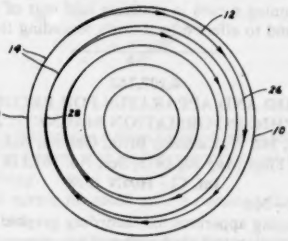
1. Apparatus for controlling tape speed in a high speed capstanless tape transport having a tape cassette-supporting surface, means for locating a cassette on that surface, a pair of motor driven let-off and take-up spindles projecting up from that surface for engagement in the cassette and a read/write head projecting up from the surface adjacent the spindles, said apparatus comprising:
A. a timing signal generator, said generator including
(1) a housing,
(2) a shaft rotatively mounted in the housing, and
(3) means for producing an electrical output in response to rotation of the shaft.
B. means for mounting the housing in the transport so that said shaft projects up from the supporting surface thereof at a point substantially aligned with the read/write head therein,
C. a wheel mounted on said shaft, said wheel being dimensioned to project into the cassette supported on the tape transport with the periphery of the wheel providing the sole means for engaging the tape therein with sufficient interference so that when the tape is moving past the head it turns the wheel correspondingly whereby the generator produces an electrical output indicative of the speed of the tape past the head,
D. means defining one or more grooves in the peripheral surface of the wheel, said grooves extending around the circumference of the wheel so as to prevent entrainment of air between the wheel and the tape,
E. a control circuit for controlling the spindle motors, and
F. means for applying the output of the generator to the control circuit so that the spindles are driven so as to maintain the speed of the tape past the read/write head substantially constant.

4,107,746

CONTINUOUS SPIRAL MODE TRACKING IN A CONVENTIONAL DISK DRIVE USING CONCENTRIC SERVO TRACKS

David Laurence Conway, Bloomington, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Oct. 25, 1977, Ser. No. 844,674
Int. Cl.[2] H04N *5/76*
U.S. Cl. 360—78 **2 Claims**



1. A system for operating a disk drive of the type used with a disk pack having a servo disk and at least one data disk and in which the disk pack rotates continuously at a constant speed and a transducer arm moves radially with respect to the disk pack, said system being a system to write and read data in a spiral tracking mode on a data disk while position is referenced with respect to a plurality of concentric servo tracks, said system comprising:
track address register means for referencing the number of the servo track being accessed,
means for incrementing said track address register means in response to a data signal,
means for receiving position error signal of a servo track transducer head with respect to a servo track and inverting said signal in response to a data signal and leaving it unchanged in the absence of a data signal,

means for receiving a once per revolution servo track index signal and generating a data signal after a predetermined time delay said data signal being transmitted to said means for receiving a position error signal and said means for incrementing said track address register,

integrator means for generating a continuous time varying signal,

means for initiating said integrator in response to a data signal from said means for receiving, and

means for summing said position error signal and the output of said integrator to form a signal for controlling said head arm transducer.

4,107,747

FLUIDIC CONTROLLED CARTRIDGE EJECTOR

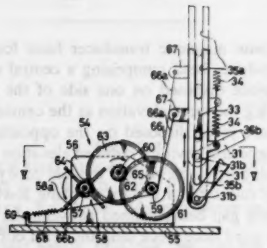
Noboru Kumaki, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 13, 1976, Ser. No. 732,136

Claims priority, application Japan, Oct. 15, 1975, 50-140287[U]

Int. Cl.² G11B *15/00, 5/00*

U.S. Cl. 360—93 **13 Claims**



1. A magnetic tape recording and/or reproducing apparatus including a housing, a cassette support frame movably mounted on said housing for movement between a first loading position and a second recording and/or reproducing position with respect to said housing; spring bias means for norally urging said support frame from said second position to said first position; releasable latch means for holding said frame in said second position against the bias of said spring bias means; a linkage coupled to said support frame; and unidirectional fluidic resistance means coupled to said linkage for exerting a fluid resistance against the movement of said frame substantially only from said second position to said first position, thereby reducing the speed of movement of said frame from said second to said first position against the bias of said spring bias means without effecting movement of said frame from the first to the second position thereof.

4,107,748

RECORDING HEAD SUPPORT ASSEMBLY

Bin-Lun Ho, Los Gatos, Calif., assignor to Memorex Corporation, Santa Clara, Calif.

Filed May 31, 1977, Ser. No. 801,648

Int. Cl.² G11B *21/16, 5/48*

U.S. Cl. 360—104 **3 Claims**

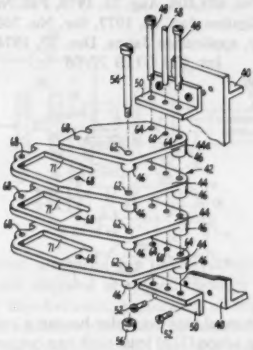
1. A recording head support assembly supporting and loading recording head slider elements for use on magnetic storage discs on a high density, direct access data storage device having an actuator with a movable armature, the support assembly comprising:

a plurality of flat, rigid arm members each having a configuration with a distal end projecting in part over the surface of a magnetic storage disc;

means for rigidly interconnecting said plural arm members in stacked, spaced relationship to define a unitary extension arm component, whereby the relative spacings and positioning of the rigid arm members are maintained within that extension arm component;

means for remvovably attaching said unitary extension arm component to said actuator armature; and

at least one first flat leaf spring means attached to each said rigid arm member for supporting and loading a slider element over a disc, said spring means having its base end fixedly attached to the distal end of said rigid arm member, said leaf spring means including a bifurcated support element having distal ends extending from the base of said leaf spring means, a flexure element connected to the distal ends of the support element and having means for connecting said flexure element to the slider element, and a loading element having means for engaging the head slider element and loading the head slider element with the predetermined loading force when the slider element is flying over a disc.



4,107,749

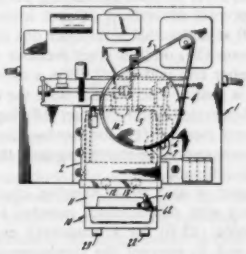
CASSETTE RECORD PLAYER-RECORDER

Kenneth B. Harper, Winnetka, Ill., assignor to Motorola, Inc., Schaumberg, Ill.

Filed May 21, 1970, Ser. No. 39,500

Int. Cl.² G11B *5/54, 21/22*

U.S. Cl. 360—105 **12 Claims**

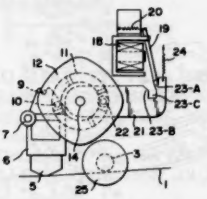


1. A tape drive unit for a tape recorder comprising a takeup reel shaft, a friction disc operatively connected with a drive source normally for driving the shaft, a transmission roller operable to operatively connect the shaft with the drive source, thereby causing the shaft to be driven at a different number of revolutions from that provided by said friction disc, control means to disengage the friction disc from operative connection with the shaft and at the same time to engage the transmission roller respectively with the shaft, and reset means for resetting said control means.

4,107,750
TRACK CHANGE-OVER MECHANISM FOR A MULTI-CHANNEL TAPE RECORDER

Itsuki Ban, 829 Higashioizumi-machi, Nerima-ku, Tokyo; Sumio Nozaki, Takashimadaira 2-chome, Tokyo; Takanori Kasuya, 1105 Kodanhagi-Yamadanchi, 2620-3, Kodaira-shi, Tokyo; Yukio Shinkado, 2-5-3, Kamabura 1-chrome, Katsushika-ku, Tokyo, and Kanji Yano, 31-17, Akitsu-cho-4-chome, Tokyo, all of Japan

Division of Ser. No. 605,406, Aug. 18, 1975, Pat. No. 4,024,582. This application Jan. 18, 1977, Ser. No. 760,409
Claims priority, application Japan, Dec. 27, 1974, 50-148788
Int. Cl.[2] G11B *21/08*
U.S. Cl. 360—106 **4 Claims**



1. In a multi-channel tape recorder having a rotary capstan (3, 25) for driving a tape (1) at least with one magnetic head (5) with a cam follower (10) attached thereto, said magnetic head being adapted to act on the tape and a rotating stepped cam means (11) with a plurality of cam steps angularly arranged and corresponding in number to the number of channels of track on the tape for steppingly shifting the magnetic tape by acting on the cam follower (10), said cam follower (10) abutting against the steps of said rotating stepped cam member (11), a track change-over mechanism for shifting said cam follower (10), comprising in combination:

a. a pivotally supporting lever member (21), with a supporting end portion for supporting said cam means (11) at said end portion and a contacting portion at the end opposite said supporting end portion;

b. an idler (12) rotatably supported on said end portion, said idler (12) being coupled to said cam means (11), said idler (12) having on its periphery a plurality of second cam portions corresponding in number to the channels of track and with shorter and longer radius portions and arranged symetrically with respect to the axis of said idler;

c. an actuator member (19) with one end and a free end, said one end being pivotally supported and said free end contacting said lever member contacting portion for controlling the pivotal movement of said lever member, bias means (20) at said actuator member one end;

d. spring means (24) on said lever member for biasing said lever member and said idler (12) in a direction such that said idler is pushed into contact with the capstan;

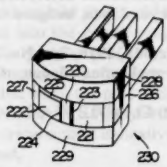
e. a solenoid-operated electromagnet (18) disposed alongside said actuator member (19) for moving the actuator when the electromagnet is energized against the force of said bias means (20); and,

f. guide means at said lever member contacting portion cooperating with said actuator member including a first guide portion (23-B) for a temporary engagement with said free end to prevent the displacement of the lever under the action of the spring means (24) when said electromagnet is energized, a second guide portion (23-C) for cooperation with said bias means (20), said bias means releasing said free end from said temporary engagement with the first guide portion (23-B) when said electromagnet is de-energized so that said free end is moved by the bias exerted by the bias means and moves into said second guide portion (23-C) and, one of the cam portions of said idler (12) comes into contact with said capstan, and a third guide portion (23-A) for re-engagement with the free end of the actuator by a see-saw pivotal movement of said lever member and the bias of said bias means (20) to thereby displace the steped cam one step and thus shifting the magnetic head by one channel of track.

4,107,751
MAGNETIC HEAD

Misao Shimoda, Hamura, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 10, 1976, Ser. No. 685,060
Claims priority, application Japan, May 26, 1975, 50/62616
Int. Cl.[2] G11B *5/12*
U.S. Cl. 360—122 **1 Claim**



1. A composite magnetic transducer head for a magnetic tape; said transducer head comprising a central core piece, a second core piece disposed on one side of the central core piece and having the same elevation as the central core piece, and a third core piece disposed on the opposite side of the central core piece and having a reduced elevation as compared with the central core piece; each of the said core pieces having a plane upper surface and a parallel plane lower surface, a record/playback gap being defined between the central core piece, and the third core piece (and the third core piece,) and an erase gap being defined between the central core piece and the second core piece; the lower plane surface of the respective core pieces extending in the same plane with each other, and a positioning block having a thickness which is equal to the difference in elevation between the central core piece and the third core piece, the positioning block being disposed on the upper surface of the third core piece, said positioning block has a plane upper surface and a parallel plane lower surface engaging the upper surface of said third core piece; the upper surfaces of the first and second core pieces and of the positioning block extending in the same plane, all of the core pieces and the positioning block being integrally secured together; the interfitting surfaces of said members being polished to a mirror finish to present a smooth surface to said tape, said core pieces and block being enclosed by non-magnetic blocks so as to form a unitary composite transducer head.

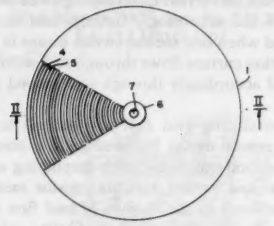
4,107,752
HIGH DENSITY MAGNETIC STORAGE DISC COMPRISING A SPIRAL OF MAGNETIC TAPE

Clark E. Johnson, Jr., Weston, Mass., assignor to Micro Communications Corporation, Waltham, Mass.

Filed Oct. 13, 1976, Ser. No. 732,142
Int. Cl.[2] G11B *5/012, 5/82*
U.S. Cl. 360—135 **7 Claims**

1. A magnetic data storage disc, comprising a cylindrical base member having a substantially flat bottom surface and a flexible plastic wall means joined to and projecting from the top surface thereof and arranged in a spiral coaxial with the cylindrical base member, adjacent convolutions of the spiral wall means having a normal position in which they are spaced from and out of contact with one another, at least one side of the wall means carrying an exposed coating of magnetic recording material for magnetically recording therein at least

one track of information, said wall means being sufficiently flexible and resilient to be deflected from said normal position



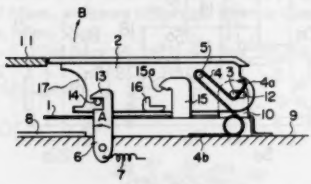
upon application of a deflecting force thereto and to return to said normal position upon removal of said force.

4,107,753

CASSETTE HOLDER CAPABLE OF ROTATION THROUGH A LARGER ANGLE OF INCLINATION

Akira Izumikawa, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Japan

Filed Sep. 3, 1976, Ser. No. 720,208
Claims priority, application Japan, Sep. 12, 1975, 50-125725
Int. Cl.[2] G11B *15/00*
U.S. Cl. 360—137 **6 Claims**



1. In a cassette tape recorder having a chassis and a cassette holder supporting plate, the improvement comprising:

a bracket mounted on said cassette holder supporting plate and carrying thereon a pivot shaft;

a cassette holder having an elongated slot formed at a rear end of said cassette holder longitudinally thereof and pivotally supported by said pivot shaft engaging said elongated slot;

biasing means for urging said cassette holder in a direction to bring said cassette holder into its open condition;

locking means for holding said cassette holder in its closed condition against the action of said biasing means;

releasing means for releasing said locking means from said cassette holder to cause said cassette holder to rotate into its open condition by the action of said biasing means; and

stopper means for maintaining said cassette holder in its open condition;

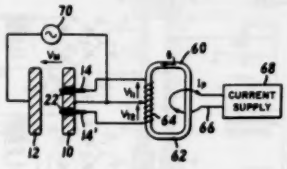
said cassette holder being movable forward along said elongated slot to disengage from said stopper means whereby said cassette holder is rotatable through a larger angle of inclination so that a cassette can be directly placed within said tape recorder.

4,107,754

DISCHARGE GAP DEVICE

Yotsuo Ishida, Chofu, and Hiroshi Kuwahara, Amagasaki, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha and The Tokyo Electric Power Co., Inc., Japan

Filed Jun. 30, 1975, Ser. No. 591,396
Claims priority, application Japan, Jul. 10, 1974, 49-79373
Int. Cl.[2] H02H *9/00*
U.S. Cl. 361—120 **2 Claims**



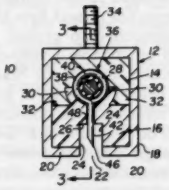
1. An electric discharge gap device comprising a pair of main electrodes disposed in spaced opposite relationship to define a gap therebetween, a plurality of trigger electrodes insulated from said main electrodes and extending through one of said main electrodes into said gap, and means for simultaneously applying electric potentials of opposite polarity to respective ones of said plurality of trigger electrodes for initiating in use a stable electric discharge across said gap between the other of said main electrodes and one of said trigger electrodes.

4,107,755

STATIC ELIMINATOR AND ION DISCHARGE MEANS THEREFOR

Richard J. Kiefer, 72 Fulton Ave., Garden City, N.Y. 11530

Filed Jan. 17, 1977, Ser. No. 760,083
Int. Cl.[2] H01T *19/04*; H05F *3/00*
U.S. Cl. 361—220 **17 Claims**



1. In a static eliminator, an insulator housing having a plurality of interengaging dielectric parts one of which has an interior cavity and longitudinally spaced apart apertures extending from said cavity to the exterior of said housing,

a plurality of electron discharge means in said housing cavity,

each said discharge means having a capacitor body and emitter pin inseparably formed as a unit with each said emitter pin being positioned snugly within a respective one of said apertures against movement relative to each other and their respective apertures and extending to the exterior of said one housing part such that each of said discharge means is longitudinally spaced from the other in said housing cavity,

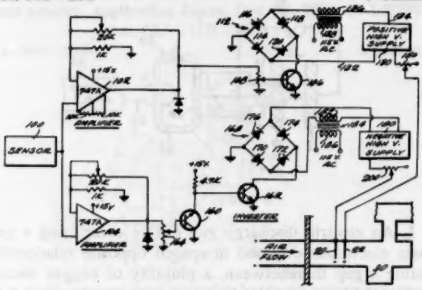
the other of said housing parts closing said cavity and enclosing said discharge means therein,

and an insulated conductor extending longitudinally into said housing through each of said capacitor bodies.

4,107,756
METHOD AND SYSTEM FOR MAINTAINING AN ELECTRICALLY NEUTRAL ATMOSPHERE

Robert H. Best, and William D. Harris, both of Greensboro, N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Division of Ser. No. 516,199, Oct. 18, 1974, Pat. No. 3,942,072.
This application Nov. 14, 1975, Ser. No. 632,007
Int. Cl.[2] H05F *1/00*
U.S. Cl. 361—231 **5 Claims**



1. An electrical circuit comprising:

a first bi-lateral switch having four branches,

a first power supply for receiving a first variable controlled A.C. input signal at input terminals and providing a D.C. high voltage output,

a first transformer having a first winding connected to a source of alternating voltage and a second winding connected between one of said input terminals of said first power supply and the connection between first and second of said branches of said first bi-lateral switch, the other input terminal of said first power supply being connected to the connection between third and fourth of said branches of said first bi-lateral switch,

first electronic switch means having a conductive and a non-conductive condition and responsive to an input signal for shifting between said conditions, said switch means being connected to the connection between said first and third branches of said first bi-lateral switch for coupling that connection to ground when said switch means is in said conductive condition, the connection between said second and fourth branches of said first bi-lateral switch being connected to ground so that when said first switch means is in its non-conductive condition no current flows through said first bi-laterial switch and accordingly through said first power supply, and when said first switch means in its conductive condition current flows through said first bi-lateral switch and accordingly through said first power supply,

a second bi-lateral switch having four branches,

a second power supply for receiving a second variable controlled A.C. input signal at input terminals and providing a D.C. high voltage output of opposite polarity to the output voltage of said first power supply,

a second transformer having a first winding connected to a source of alternating voltage and a second winding connected between one of said input terminals of said second supply and the connection between first and second of said branches of said second bi-lateral switch, the other input terminal of said second power supply being connected to the connection between third and fourth of said branches of said second bi-lateral switch,

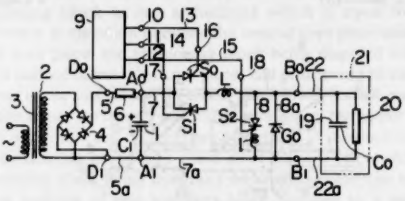
second electronic switch means having a conductive and a non-conductive condition and responsive to an input signal for shifting between said conditions, said second switch means being connected to the connection between said first and third branches of said second bi-lateral switch for coupling that connection to ground when said second switch means is in said conductive condition, the connection between said second and fourth branches of said second bi-lateral switch being connected to ground so that when said second switch means is in its non-conductive condition no current flows through said second bi-lateral switch and accordingly through said second power supply, and when said second switch means in its conductive condition current flows through said second bi-lateral switch and accordingly through said second power supply, and

means for producing said first and second input signals including sensor means for producing a control signal, first and second means for each amplifying said control signal, first and second variable resistor means, respectively connected to the outputs of said first and second amplifying means, first means connecting said first variable resistor means to said first bi-lateral switch and second means connecting said second variable resistor means to said second bi-lateral switch including means for inverting the output of said second variable resistor means.

4,107,757
PULSE POWER SOURCE

Senichi Masuda, 40-10-605, 1-chome, Nishigahara, Kita-ku, Tokyo-to, Japan, and Junji Hirai, Nagoya, Japan, assignors to Senichi Masuda, Japan

Filed Jun. 30, 1977, Ser. No. 811,786
Int. Cl.[2] B05B *5/00*
U.S. Cl. 361—235 **12 Claims**



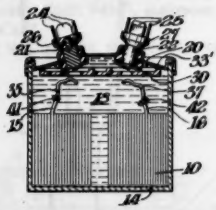
1. A pulse power source for applying a pulse voltage to a capacitive load, comprising a D.C. power source, a power source capacitor having a sufficiently large electrostatic capacity with respect to an electrostatic capacity of said capacitive load and connected across said D.C. power source via a current limiting impedance, a parallel connection of a load charging switch element and a load charge recovering switch element which can be individually opened or closed, said parallel connection of switch elements and an inductance for generating transient oscillation being serially connected between one end of said power source capacitor and one end of said capacitive load, the other end of said power source capacitor being connected to the other end of said capacitive load, a parallel connection of a rectifier element for preventing inverse charging of said capacitive load and a switch element for discharging residual charge on said capacitive load, which are connected in parallel to said capacitive load, and control means for successively making said load charging switch element, charge recovering switch element and residual charge discharging switch element conduct in the above-described sequence for a period substantially equal to a pulse width of said pulse voltage, a period substantially equal to one-half period of said transient oscillation and a pulse pause interval, respectively.

4,107,758

FUSED OIL FILLED CAPACITOR

George A. Shirn, Williamstown; Raynor Linzey, Adams, and Carol A. Cushenette, Williamstown, all of Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed May 16, 1977, Ser. No. 797,202
Int. Cl.[2] H01G 1/01
U.S. Cl. 361—275 15 Claims



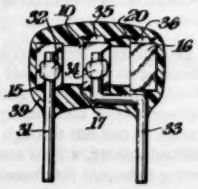
9. A fused oil filled capacitor comprising a closed housing; a capacitor section within said housing; said section having a pair of sheet electrodes, and a dielectric spacer between said electrodes; a dielectric oil impregnating said section and essentially filling said housing; at least one terminal passing through a wall of said housing; an electrical conductor being connected between one of said electrodes and said terminal forming a circuit path therebetween; a strand of an exothermically alloyable fuse consisting of two metal elements in intimate contact with each other, said strand being a part of said conductor, a joint by which said strand is connected within said circuit path consisting of solder having a melting temperature lower than the elevated temperature of said oil which would cause the bursting of said housing.

4,107,759

FUSED MONOLITHIC CERAMIC CAPACITOR PACKAGE

George A. Shirn, Williamstown, and John P. Maher, Adams, both of Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed May 16, 1977, Ser. No. 797,203
Int. Cl.[2] H01G 1/11
U.S. Cl. 361—275 14 Claims



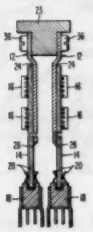
1. A fused monolithic ceramic capacitor package comprising a monolithic ceramic capacitor body having two sets of buried electrodes, three terminations on said body, a resin housing enclosing said capacitor body and said terminations, a first of said terminations connected to one of said sets of electrodes, a second of said terminations connected to the other of said sets of electrodes, a fuse of two exothermically alloyable metal elements in intimate contact with each other, said fuse being embedded in said resin housing, said fuse having a thermal connection to said capacitor body and an electrical connection between said second termination and a third of said terminations to provide a series electrical connection with said capacitor body, and external electrical terminals to said first termination and to said third termination, respectively, to provide electrical access to said capacitor body.

4,107,760

DUAL PRINTED CIRCUIT CARD MOUNT ASSEMBLY

Karl Joseph Zimmer, Berwyn, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed May 31, 1977, Ser. No. 801,455
Int. Cl.[2] H05K 7/20
U.S. Cl. 361—383 6 Claims



1. An assembly for mounting dual printed circuit cards, each of which has a plurality of edge tabs, each of said cards having electronic components mounted on one side thereof, said assembly comprising:

a pair of metallic back-up plates, each of said plates being generally planar but having a substantially rectangular recessed area defined by an offset frame on three sides thereof, the other side of each of said circuit cards being affixed to one of said plates within said recessed area, a portion of each of said plates adjacent the fourth side of said recessed area being cut away leaving only the respective extensions of said frame on opposite sides thereof, the edge tabs of each of said circuit cards being situated in said cut away portion of one of said plates;

a pair of connectors each having a plurality of electrical contacts, said contacts engaging said edge tabs of one of said circuit cards, means for rigidly fastening each of said connectors to the frame extensions of one of said plates;

a header member, means fastening the frame portions of both said plates situated opposite to said cut away areas to said header, and

a pair of spacer elements affixed to the respective frames at opposite sides of said recessed areas and in proximity to said connector means, a pair of shoulder screws, said spacer elements being tapped to receive said screws, said frames having respective apertures in substantial alignment with said spacer elements whereby said screws engage said elements via said apertures for coupling said plates to each other in a parallel spaced-apart relationship, thereby completing said assembly, said assembly having a substantially unobstructed opening between said plates for air flow in a direction parallel to the longitudinal axes of said connectors, said spacer elements and shoulder screws permitting slight lateral movements of said pair of connectors with respect to each other to compensate for mounting tolerances.

4,107,761

ELECTROLYTIC CAPACITOR AND ELECTROLYTE

Makoto Oyama, Hitachi, Japan, assignor to United Chemi-Con, Inc., Rosemont, Ill.

Filed Mar. 28, 1977, Ser. No. 781,847
Int. Cl.[2] H01G 9/02
U.S. Cl. 361—433 12 Claims

1. An electrolyte adapted to be incorporated into an electrolytic capacitor for use at elevated temperatures of from about 85° to 110° C. and voltages up to 500 V in the presence of a metal foil electrode, said electrolyte consisting essentially of per 100 parts by weight:

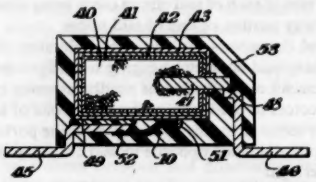
Ingredient	Parts
Ammonium pentaborate	10 to 30
Boric acid	0 to 20
Ethylene glycol	30 to 70
Water	0 to 10
Ketone selected from 2,4-pentanedione, 2,4-hexanedione, cyclohexanone, and mixtures thereof	2.8 to 30
Polar organic solvent selected from at least one of butyrolactone, monomethyl ether of ethylene glycol, monoether ether of ethylene glycol, monobutyl ether of ethylene glycol	0 to 10

4,107,762

SOLID ELECTROLYTE CAPACITOR PACKAGE WITH AN EXOTHERMICALLY-ALLOYABLE FUSE

George A. Shirn, Williamstown, and John P. Maher, Adams, both of Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed May 16, 1977, Ser. No. 797,206
Int. Cl.[2] H01G *9/00*; B01J *17/00*
U.S. Cl. 361—433 **15 Claims**



1. A fused capacitor package including a solid electrolyte capacitor body having two terminals, a housing enclosing said body and two leads extending to the outside of said housing, wherein the improvement comprises a fuse made of two exothermically alloyable elements in intimate contact with each other; said fuse being enclosed by said housing, and being connected between one of said terminals and one of said leads, and thus having a series electrical connection with said body, the other of said leads being connected to the other of said terminals, said fuse having a thermal connection to said capacitor body.

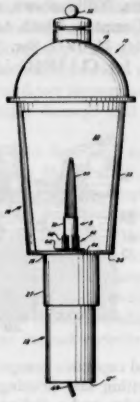
4,107,763

LAMP ADAPTING KIT

William A. Thiel, Chicago, and Harry Dziedzic, Glenview, both of Ill., assignors to Rank Precision Industries, Inc., Des Plaines, Ill.

Filed Nov. 26, 1976, Ser. No. 745,382
Int. Cl.[2] F21V *7/04*
U.S. Cl. 362—32 **28 Claims**

28. A flame-simulating optical element comprising a longitudinally extending bundle of parallel-oriented optical fibers, one end of said bundle being adapted to be exposed to a light source, the other end of said bundle being shaped to simulate a flame, the ends of said fibers being exposed at said shaped end



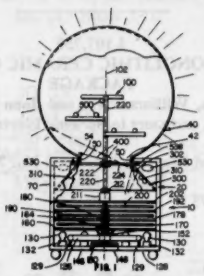
of said bundle and the exposed ends of at least some of said fibers having a greater surface area than the other ends.

4,107,764

LIGHT DISPLAY

Bruce G. Riley, 8026 Maple St., Omaha, Nebr. 68134

Filed Oct. 1, 1975, Ser. No. 618,490
Int. Cl.[2] A47G *33/16*
U.S. Cl. 362—35 **9 Claims**



1. A varying pattern light display comprising: a frame, a hollow display housing mounted on said frame, a substantial portion of said display housing being translucent so as to provide a display surface means, said display housing having an opening therethrough on one side through which opening light can enter said display housing, a light source attached to said frame and delivering light into said housing, a light blocking means mounted on said frame between said source and said display surface means, said light blocking means having a light passage therethrough permitting light from said source to reach said housing opening, said blocking means blocking substantially all light from said source from reaching said translucent display housing except that light which passes through said display housing opening, a light dispersing means, said light dispersing means having portions moving in closed pathways transversely across the paths of light rays moving from said source to the inner surface of said display housing, means for driving said light dispersing means comprising an upwardly extending elongated post, means for mounting said post on said frame and for causing said post to rotate about an upwardly extending axis, said light dispersing means portions being disposed in spaced positions with respect to each other and being disposed in positions spaced outwardly from said

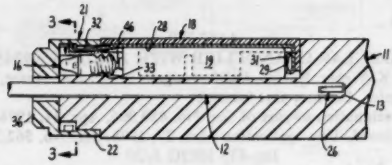
post in directions transversely of said axis, means attaching each said light dispersing means portion to said post so that said light dispersing means portions each rotate around said axis.

4,107,765

SELF-ILLUMINATING HAND TOOL

Max C. Singleton, Novato, Calif., and Lea Frances Elgart, 100 Village Cir., Novato, Calif. 94947, assignors to Lea Frances Elgart, Novato, Calif.

Filed Sep. 2, 1976, Ser. No. 719,989
Int. Cl.² F21L *7/00*
U.S. Cl. 362—120 **12 Claims**



1. A self-illuminating hand tool, comprising an elongated handle;

a shank extending from said handle with a work engaging tool structure at its distal end;

a prefocussed light bulb mounted in said handle in fixed position to direct a beam of light emitted therefrom onto work engaged by said tool structure;

power supply means in said handle for supporting an electric power source and effecting electrical connection of same with said bulb end;

switch means formed for making and breaking said electrical connection and including a metal strip having an end portion thereof extending alongside and normally spaced from the base of said light bulb, and an annular member rotatably mounted on the end of said handle encircling said shank for manual engagement and rotary displacement between a power on position making said electrical connection and a power off position breaking said electrical connection;

said annular member being formed for engaging and urging said end portion against said light bulb base upon rotation to said power on position;

said handle being formed with a recess in a side thereof accommodating said power supply means and said light bulb, and said power supply means including a cover for said recess to provide a smooth continuation of the configuration of said handle.

4,107,766

EMERGENCY POWER FAILURE LIGHT

Fred E. Baker, Asheboro, N.C., assignor to General Electric Company, Bridgeport, Conn.

Filed Oct. 4, 1976, Ser. No. 728,979
Int. Cl.² F21V *21/08, 25/00*
U.S. Cl. 362—226 **5 Claims**

1. An emergency power failure light having a multi-piece assembled housing with a safety interlock system comprising:

a bottom cup-shaped member enclosing and supporting the electrical components therein and having protruding male prongs on the back for plugging into an AC outlet;

a mid cover sized to fit completely over said bottom member and open at the top with a bottom wall to completely close over the electrical components;

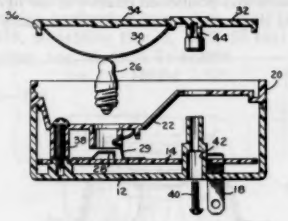
said bottom wall having an apertured bulb socket therein with an electrical contact at the bottom thereof;

a curved reflector mounted over said bulb;

a lens-containing coverplate completely covering said mid cover;

said coverplate having a threaded socket therein extending through said mid cover, and

single bolt means through the back of said bottom member securing the coverplate and mid cover thereto;



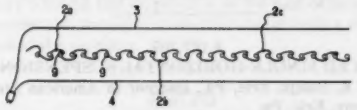
whereby the entire assembly must be removed from the AC outlet before the bolt means can be detached for coverplate removal for bulb changing.

4,107,767

FLEXIBLE LIGHTING STRIP

Jacques Anquetin, 7, rue de la Gouttiere, 78640 Neauphle le Chateau, France

Filed Apr. 29, 1977, Ser. No. 792,373
Claims priority, application France, May 10, 1976, 76 13941
Int. Cl.² F21V *1/00*
U.S. Cl. 362—236 **10 Claims**



1. A flexible electric lighting strip, comprising an elongate section of plastics material including a longitudinal cylindrical cavity containing a chain of electric lamps; a rear portion containing longitudinal supply conductors for feeding the lamps from an electricity supply, the rear portion being filled with a translucent compound which adheres to the plastics material of the section; and a middle portion between the cavity and the rear portion and having a longitudinal triangular slit with its apex in communication with the cylindrical cavity; the strip further including a plurality of conductors interconnecting the supply conductors and the lamps and extending through and gripped at said apex; and a metallic sheet at the rear of the translucent compound and adhered to the compound.

4,107,768

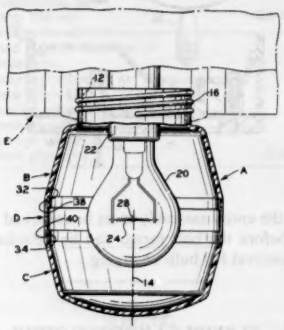
GLOBE FOR LIGHTBULBS

Jack L. Lemkin, Cincinnati, Ohio, assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Jan. 17, 1977, Ser. No. 760,126
Int. Cl.² F21V *3/00*
U.S. Cl. 362—363 **14 Claims**

1. A globe for a bulbous-type incandescent lightbulb having a longitudinal bulb axis, said globe having an opening at one end sized for freely receiving the lightbulb therethrough while the lightbulb is mounted in an electrical socket by moving said globe axially with said opening therein aligned with the lightbulb so the lightbulb passes through said opening for positioning said globe in surrounding relationship to the lightbulb, said globe including a closed end opposite from said opening and having a central longitudinal globe axis extending between said opening and closed end, said globe axis being substantially coincidental with said bulb axis, said globe including opposite

parts of light transmitting synthetic plastic material inseparably bonded in spaced relationship to opposite edges of a heat dissipating metal ring surrounding said globe axis in radially-spaced relationship thereto and having a ring axis substantially coincidental with said globe axis and with said bulb axis, said globe being sized and positioned relative to the lightbulb such that said parts of plastic material would normally melt from



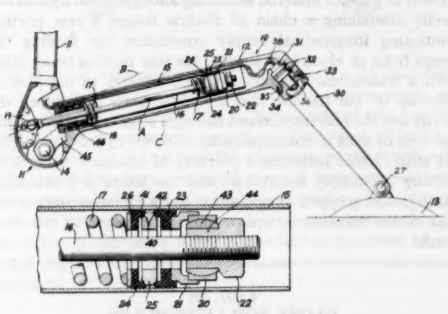
heat produced by the lightbulb but being maintained at a temperature below melting by dissipation of heat from the lightbulb and globe through said ring, and said parts being inseparably bonded to said ring in the sense of being bonded thereto by such procedures as heat fusion, ultrasonic welding, or adhesive or the like as opposed to being joined by mechanical fasteners or a joint which is readily disassembled or separated.

4,107,769

BALANCED SINGLE HORIZONTAL SUSPENSION ARM

Satinder K. Saluja, Erie, Pa., assignor to American Sterilizer Company, Erie, Pa.

Filed Mar. 21, 1977, Ser. No. 779,498
Int. Cl.[2] F21V *21/18*
U.S. Cl. 362—402 **10 Claims**



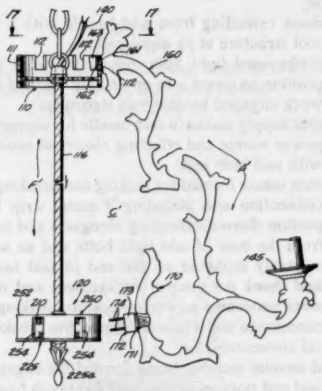
1. A lamp support comprising,
a base,
a hollow arm,
first pivot means swingably supported on said base,
a lamp head supported on the distal end of said hollow arm,
a tubular surface means in said hollow arm generally concentric thereto,
a rod in said tubular surface generally concentric thereto,
a helical compression spring in said tubular surface and bracket means on said arm engaging the said end of helical spring adjacent said base,
second pivot means on said base pivotally connecting said rod to said base at a position spaced from said first pivot means and bearing means pivoted to the distal end of said rod,
said bearing means engaging a second end of said spring and being slidably received on said tubular surface and engaging said helical spring and forming a stop therefor,
said bearing having means allowing said rod to swing relative to a tube whereby the counter-balancing moment of said pivot by said spring is substantially equal to the acting moment of said lamp on said arm about said first-mentioned first pivot point.

4,107,770

MODULAR CHANDELIER WITH PLUG-IN ARMS

Frank K. Weber, Encino, Calif., assignor to Gene W. Arant, Los Angeles, Calif., a part interest

Continuation-in-part of Ser. No. 459,906, Apr. 11, 1974, abandoned. This application Mar. 27, 1975, Ser. No. 562,337
Int. Cl.[2] H02G *3/20*
U.S. Cl. 362—405 **47 Claims**

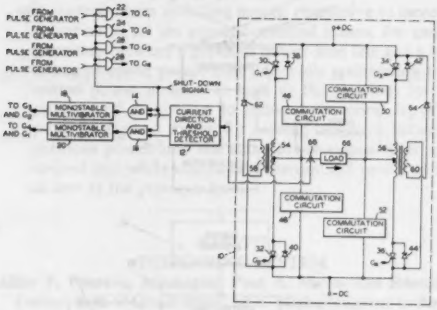


1. A modular chandelier with plug-in arms, comprising:
a chandelier central body having a generally circular peripheral wall and having a plurality of circumferentially spaced windows formed in said wall;
a distributor disposed within said central body, including a flat insulating spacer aligned with said windows, a pair of flat circular metallic plates engaging the upper and lower surfaces, respectively, of said spacer, and the circumferential edges of said plates being radially curved away from said spacer and from each other;
means restraining the movement of each of said plates in a vertical direction away from said spacer;
a plurality of detachable chandelier arms, each having on its inner end a rigidity extending male plug which includes an insulating base and a parallel pair of flat metallic prongs projecting therefrom; and
the distance between said plug prongs being substantially equal to the thickness of said spacer, and each said plug base being of such size and configuration as to be insertable within a corresponding one of said windows, whereupon the associated flat metallic prongs come into firm contact througout a substantial portion of their length with the respective metallic plates;
each said window being of non-circular configuration and the corresponding insulating base being of non-circular configuration and interfitting therewith.

4,107,771
CIRCUIT FOR SHUTTING DOWN AN INVERTER

Thomas E. Anderson, Normal; Ole N. Ibsen, Bloomington, both of Ill., and Loren H. Walker, Salem, Va., assignors to General Electric Company, New York, N.Y.

Filed Feb. 22, 1977, Ser. No. 770,736
Int. Cl.[2] H02M 1/18
U.S. Cl. 363—58 6 Claims



1. In combination, a self-commutating inverter and means for shutting down said inverter, said inverter including a load and at least first and second legs connected across a direct current source of potential, each leg including a series combination of at least first and second gate controlled rectifiers, at least first and second diodes connected in parallel and reverse polarity relationship across said first and second gate controlled rectifiers respectively, a commutating interval current limiting center tapped reactor connected in series and interposed between said rectifiers, and commutating means connected to the center tap of said reactor, said load being connected between the center tapped reactors of the respective first and second legs, said means for shutting down said inverter comprising:

(a) means for sensing the instantaneous direction and magnitude of the instantaneous current flowing through said load;

(b) means responsive to the direction and magnitude of the current sensed for generating a first output signal when the magnitude of the current exceeds a predetermined threshold level and is flowing in a first direction, and for generating a second output signal when the current exceeds the predetermined magnitude and is flowing in a direction opposite the first direction;

(c) means responsive to the simultaneous receiving of a shutdown signal and the generated first output signal for generating a first gating pulse to be applied to said second gate controlled rectifier in said first leg and to said first gate controlled rectifier in said second leg to cause the current flowing through said load to quickly extinguish;

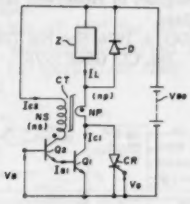
(d) means responsive to the simultaneous receiving of the shutdown signal and the generated second output signal for generating a second gating pulse to be applied to said first gate controlled rectifier in said first leg and to said second gate controlled rectifier in said second leg to cause the current flowing through said load to quickly extinguish; and

(e) means responsive to the shutdown signal for inhibiting further regular gating of said first and second gate controlled rectifiers in either of said first and second legs to ensure quick turn off of said inverter.

4,107,772
CHOPPER CONTROL DEVICE

Ryohei Uchida; Satoshi Utsumi, both of Himeji, and Masahiko Akamatsu, Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 15, 1976, Ser. No. 741,673
Claims priority, application Japan, Nov. 14, 1975, 50-137497; Nov. 26, 1975, 50-141404; Dec. 3, 1975, 50-144173; Aug. 25, 1976, 51-102004; Aug. 25, 1976, 51-102005
Int. Cl.[2] H02M 7/515
U.S. Cl. 363—124 20 Claims

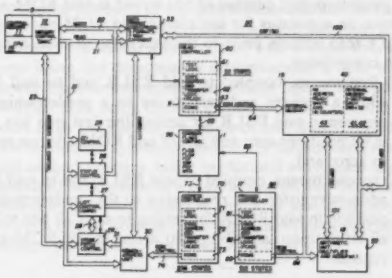


1. A chopper control device comprising: a transformer having a primary winding and a secondary winding; a series circuit including a dc power source, a dc load, the primary winding of the transformer for detecting a load current, and a thyristor; a normally non-conductive transistor connected in parallel to said thyristor; wherein the secondary winding of the transformer is connected to the dc power source and means connected between the secondary winding of the transformer and the base of the transistor for deriving a current from said secondary winding and supplying it to the base of said transistor to render the transistor conductive and provide a short-circuit around the thyristor.

4,107,773
ADVANCED ARRAY TRANSFORM PROCESSOR WITH FIXED/FLOATING POINT FORMATS

Cecil R. Gilbreath, and Jimmie L. Womble, both of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 13, 1974, Ser. No. 469,258
Int. Cl.[2] G06F 9/16, 9/18, 9/20, 15/34
U.S. Cl. 364—200 13 Claims



1. A special purpose auxiliary array processor for use in conjunction with the central computer memory of a general purpose computer which comprises:

(a) an address controller, having a ROM, operably connected to the central computer memory,

(b) a read controller, having a ROM, operably connected to the central computer memory,

(c) a process controller, having an ROM, operably connected to the central computer memory,

(d) a dual memory and an arithmetic unit each operably connected to each of the controllers, and

(e) a flag unit operable responsive to words from said ROMs

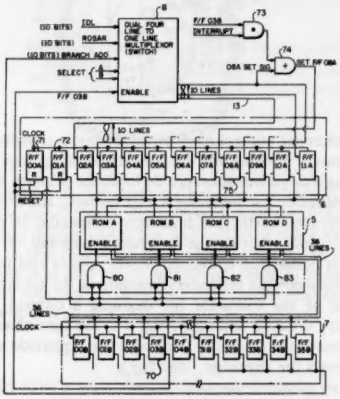
and including logic circuit means for producing two mutually exclusive output signals operable to change output signals in respose to selected words from said ROMs, said address controller, data handler, and process controller being operably responsive to said output signals and synchronized thereby.

4,107,774

MICROPROGRAM SPLATTER RETURN APPARATUS

Thomas F. Joyce, Burlington, and Michel M. Raguin, Medford, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Oct. 4, 1976, Ser. No. 729,065
Int. Cl.[2] G06F *9/16*
U.S. Cl. 364—200 **8 Claims**



1. In a data processing system having at least one read only memory (ROM) for storing a plurality of microprograms each microprogram comprised of a plurality of microwords with each microword comprised of a plurality of bits, any of said microwords stored in said ROM being addressed by a predetermined number of bits stored in a ROM address register coupled to said ROM, said data processing apparatus further comprised of a ROM-local register (RSLR) also coupled to said ROM for storing any of said microwords addressed by said predetermined number of bits stored in said ROM-address register, an apparatus for initializing said ROM-address register to a zero address prior to the execution of each microprogram comprising:

(a) first means, coupled to said RSLR and to said ROM-address register and responsive to a predetermined bit position in said RSLR for setting the first two bits stored in bit positions zero and one of said ROM-address register, to zero; and,

(b) second means, coupled to said RSLR and to said ROM-address register and responsive to the predetermined bit position in said RSLR for setting to zero all bits stored in all bit positions after bit position one in said ROM-address register.

4,107,775

HUMAN BODY COMPARISON USING DRIVING POINT PARAMETERS

James H. Ott, Akron, Ohio, assignor to Novar Electronics Corporation, Barberton, Ohio

Filed Mar. 16, 1976, Ser. No. 667,287
Int. Cl.[2] G06F *1/00*
U.S. Cl. 364—413 **25 Claims**

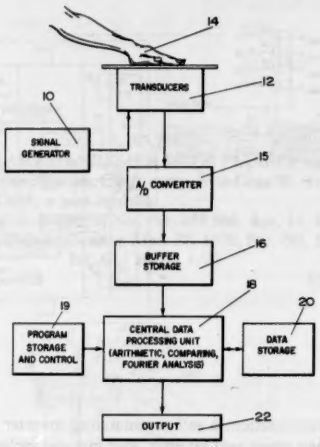
1. A method for comparing a subsequently interrogated person with a previously interrogated person, the method comprising:

(a) applying non-impulsive, physical vibration wave energy to a selected driving point on a human body at a plurality of frequencies to generate force and motion variations at said driving point;

(b) detecting a first set of data, while said wave energy is being applied, which data represents at least one of said variations as a function of time at said driving point;

(c) storing said first set of data;

(d) subsequently applying non-impulsive, physical vibration wave energy to a subsequent, corresponding driving point



on a human body at a plurality of frequencies to generate subsequent force and motion variations at said subsequent driving point;

(e) detecting a second set of data, while said wave energy is being applied, said second set of data representing at least one of said subsequent variations as a function of time at said subsequent driving point; and

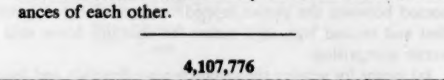
(f) comparing said first set of data with said second set of data to determine whether they are within selected tolerances of each other.

4,107,776

VEHICLE POWER TRANSMISSION ARRANGEMENTS AND ELECTRONIC POWER CONTROLS

Julian R. A. Beale, Reigate, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 24, 1977, Ser. No. 771,699
Claims priority, application United Kingdom, Dec. 22, 1976, 28896/76; Dec. 22, 1976, 43598/76; Dec. 22, 1976, 51430/76
Int. Cl.[2] B60K *41/18*; G06F *15/20*
U.S. Cl. 364—431 **19 Claims**



1. A power arrangement for a wheeled vehicle having a drive shaft, said arrangement comprising an engine, continu-

ously variable gearing between the engine and the drive shaft, power-command means operable by a vehicle driver to command a variation in engine power, and electronic control means for varying the torque transmitted by the continuously variable gearing,

said control means being responsive to the engine speed w_e, the drive shaft speed w_d and the extent of actuation R_a of the power command means such that the torque transmitted to the drive shaft is a different function of engine speed w_e for different values of R_a, said different functions corresponding to different power-load lines on an engine-power engine-speed graph, and

said control means including means, responsive to increased actuation R_a of the power-command means, for causing transition between a previous power-load line and a higher-engine-speed power-load line while maintaining transmitted power at least as high as the previous level of power, and responsive to reduced actuation R_a of the power-command means, for causing transition between a previous power-load line and a lower-engine-speed power-load line while maintaining transmitted power at least as low as the previous level.

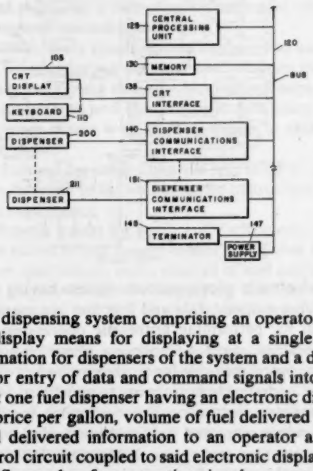
4,107,777
DISPENSING SYSTEM

Allen F. Pearson, Muskegon; Paul A. Mayo, and Ronald N. Lorenz, both of Grand Blanc, all of Mich., assignors to Anthes Imperial Limited, Rexdale, Canada

Continuation of Ser. No. 619,318, Oct. 3, 1975, abandoned. This application Jun. 13, 1977, Ser. No. 805,874

Int. Cl.[2] G06F *15/56;* **B67D** *5/08*

U.S. Cl. 364—465 **22 Claims**



1. A fuel dispensing system comprising an operator console including display means for displaying at a single location status information for dispensers of the system and a data entry keyboard for entry of data and command signals into the system, at least one fuel dispenser having an electronic display for displaying price per gallon, volume of fuel delivered and total cost of fuel delivered information to an operator and a dispenser control circuit coupled to said electronic display including a single flow pulser for generating signals representative of the volume of fuel dispensed therefrom, said dispenser control circuit including output circuit means coupled to said generating means for periodically providing an electrical signal comprising at least one binary word including dispenser status information and volume of fuel dispensed information; said dispenser control circuit further including input circuit means responsive to an input electrical signal comprising at least one binary word for controlling the status of said dispenser; means for coupling said dispenser control circuit to said operator console; said operator console including a central processing unit (CPU), a memory, and interface circuit means for coupling said CPU to said display means, to said data entry keyboard and to said dispenser control circuit, said memory comprising a control means for controlling the operation of said CPU to transfer and process data related to the dispensing of fuel by said at least one dispenser including volume data from said volume representative signals between said display means, said data entry keyboard and said dispenser control circuit of said at least one dispenser, and to generate binary input words applied to said input circuit means of said dispenser control circuit for controlling the operation of said dispenser.

4,107,778
DIGITAL FAULT-LOCATION CALCULATION SYSTEM

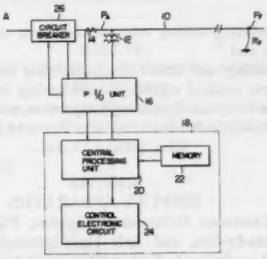
Yoshiji Nii, Kawaguchi; Takayuki Matsuda, Tokyo; Yoichi Yamazaki, and Haruo Nohara, both of Hitachi, all of Japan, assignors to Hitachi, Ltd. and The Tokyo Electric Power Co., Inc., both of, Japan

Filed Feb. 15, 1977, Ser. No. 768,841

Claims priority, application Japan, Feb. 18, 1976, 51-15979

Int. Cl.[2] G01R *31/08;* **G06F** *15/20*

U.S. Cl. 364—492 **30 Claims**



1. A digital fault-location calculating system for a power transmission system comprising:

first means coupled to said power transmission system for obtaining information indicating conditions of said power transmission system including voltage and current information;

a computer; and

second means coupled between said first means and said computer for transferring the information obtained by said first means from said first means to said computer, said second means transferring a signal indicating on-off conditions of a circuit breaker provided in said power transmission system from said circuit breaker to said computer;

said computer having at least two functions which are performed on the basis of the information transferred thereto through said second means and in accordance with predetermined processes, a first one of said at least two functions being the detection of occurrence of a fault in said power transmission system, a second one of said at least two functions being the calculation of distance to the fault point from the installation point of said digital fault-location calculating system on said power transmission system, said second function being performed only upon the detection of occurrence of a fault in said power transmission system by said first function and after said computer receives a circuit breaker open signal indicating said circuit breaker has been opened from its closed state.

4,107,779
PROGRAMMABLE CONTROLLER FOR CONTROLLING REPRODUCTION MACHINES

Bernard C. Fisk, Dallas, Tex., and James M. Donohue, Los Alamitos, Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 12, 1974, Ser. No. 496,662

Int. Cl.[2] G06F *15/20;* **G03G** *15/00*

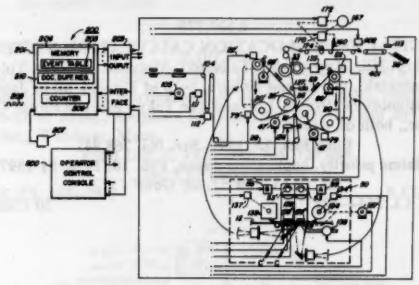
U.S. Cl. 364—518 **5 Claims**

1. A method of operating a reproduction system including a reproduction machine having a plurality of process step implementing means and a programmable controller operatively

connected to enable said plurality of process step implementing means, comprising the steps of:

inputting a reproduction run instruction of a predetermined characteristic to said controller;

storing an operating program having instruction routines for



determining timing intervals between successive process steps; and

commanding said controller to operate and generate timed process control signals at said timing intervals in accordance with said operating program to make reproductions in succession for said reproduction run instruction.

4,107,780

DISPLAY APPARATUS

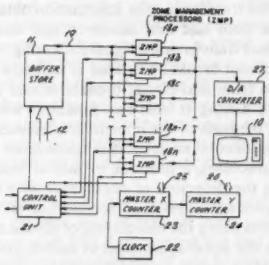
Richard Lawrence Grimsdale, Brighton; Philip John Willis, Shoreham-by-Sea, and Aris Hadjiaslanis, Brighton, all of England, assignors to National Research Development Corporation, London, England

Filed Jan. 25, 1977, Ser. No. 762,799

Claims priority, application United Kingdom, Jan. 28, 1976, 03301/76

Int. Cl.[2] G06F *15/20*; G09B *9/08*

U.S. Cl. 364—521 **13 Claims**



1. Apparatus for controlling intensity in a raster display, including a plurality of data processors each capable, when supplied with signals defining a zone of a display, of managing the display of that zone by providing intensity control signals when that zone is to be displayed, allocation control means for allocating the data processors to zones, and means for transferring signals defining zone boundaries to the data processors under the control of the allocation control means, each data processor including a local store for storing signals defining the boundaries of a zone allocated to that data processor, means for deriving signals representing the co-ordinates of points in the boundaries of the zone allocated from the signals stored, comparison means for comparing signals representing the co-ordinates of the current display point in the display raster with the signals representing the co-ordinates of the said points, and local control means, coupled to the comparison means, for passing control signals for determining the intensity of the display within the zone allocated to the output of the processor when the said co-ordinates of the current display point are within the zone allocated to that processor.

4,107,781

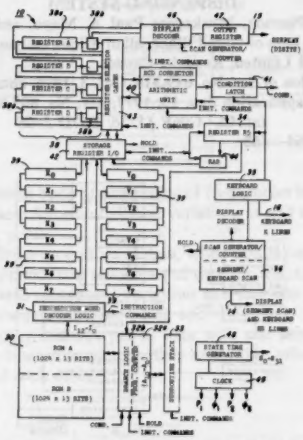
ELECTRONIC CALCULATOR OR MICROPROCESSOR WITH INDIRECT ADDRESSING

Johnny M. Barrett, Richardson, and Stephen P. Hamilton, Garland, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 27, 1976, Ser. No. 736,001

Int. Cl.[2] G06F *9/20*

U.S. Cl. 364—700 **22 Claims**

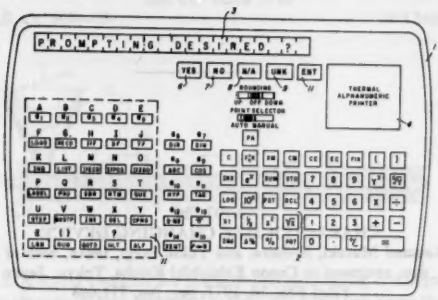


1. An electronic microprocessor system having input means for receiving numeric data and function commands, an arithmetic unit for performing arithmetic operations on numeric data, an address register responsive to said input means, an instruction word memory for storing a number of instruction words and addressable in response to an address stored in said address register, instruction decoder means for decoding instruction words outputted from said instruction word memory and for controlling said system in response thereto, a plurality of operational registers for storing numeric data, means responsive to said decoder means for coupling said operational registers to said arithmetic unit, an auxiliary register coupled to the output of said arithmetic unit for temporarily storing at least a portion of all the numeric data outputted by said arithmetic unit and branch logic means coupled to said instruction word decoder means, said address register and said auxiliary register, said branch logic means being selectively operable in a first mode in response to the decoding of a particular instruction word for modifying at least a portion of the contents of said address register in response to contents of said auxiliary register for performing an indirect address branch and selectively operable in a second mode in response to the decoding of another instruction word for modifying at a least a portion of the contents of said address register in response to said another instruction word for performing a direct address branch.

4,107,782
PROMPTING PROGRAMMABLE CALCULATOR

Michael J. Cochran, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 622,280, Oct. 10, 1975, abandoned.
This application Jun. 27, 1977, Ser. No. 810,660
Int. Cl.[2] G06F *15/06*
U.S. Cl. 364—706 11 Claims



1. A programmable calculator having program storage and program execution modes comprising:

a. a keyboard having function keys and alphanumeric data entry means and a plurality of response keys;

b. storage means for storing data and user program instructions including prompting messages which indicate specific information required by a user program in order to proceed executing a user program with said calculator in said program execution mode;

c. means selectively coupling said keyboard to said storage means for transferring data and user program instructions including prompting messages in a selected sequence from the function keys and alphanumeric data entry means to said storage means with said calculator in said program storage mode;

d. control means for controlling the operation of said calculator in response to the user program instructions stored in said storage means;

e. an arithmetic means for performing arithmetic operations on data stored in said storage means in response to the user program instructions under control of said control means;

f. output display means for displaying data stored in said storage means and for displaying said prompting messages; and

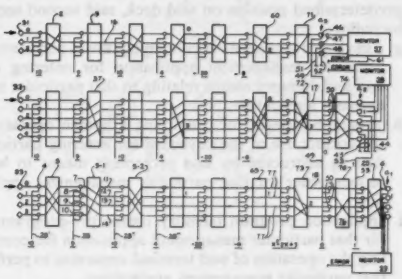
g. means selectively coupling said response keys to said control means for controlling said calculator to selectively proceed in the execution of the user program in one of a plurality of different preselected manners whenever said response keys are actuated in response to the display of said prompting messages.

4,107,783
SYSTEM FOR PROCESSING ARITHMETIC INFORMATION USING RESIDUE ARITHMETIC

Alan Huang, Menlo Park, Calif., assignor to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Feb. 2, 1977, Ser. No. 764,994
Int. Cl.[2] G06F *7/38*
U.S. Cl. 364—746 72 Claims

1. In a system for processing arithmetic information employing a residue number system employing a modulus including a processing segment associated with said modulus, a plurality of processing stages within said segment; each processing stage including at least one map means having input states and output states representing the same residue digits, one state for each residue digit; said output states being related to the input states by MOD (P (input state), m_i) where P is an integer polynomial, and m_i is the modulus of the segments; and means

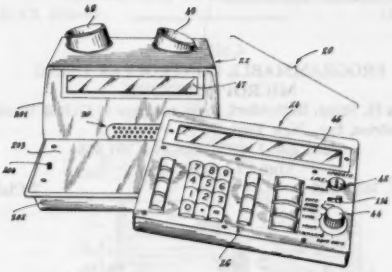


routing the output of one map to the related input of the next map.

4,107,784
MANAGEMENT CONTROL TERMINAL METHOD AND APPARATUS

Henri M. Van Bemmelen, 21 W. Bank Rd., Rye, N.Y. 10580

Filed Dec. 22, 1975, Ser. No. 643,173
Int. Cl.[2] G06F *3/02*
U.S. Cl. 364—900 18 Claims



1. Management control terminal apparatus specifically adaptable to a particular management application comprising:

first and second sections which are detachable and separatable one from the other, said sections being matable together in operative relationship for forming said management control terminal apparatus;

said first and second sections having respective first and second mating detachable electrical connector means for electrically interconnecting said first and second sections to complete said management control terminal apparatus when said sections are mated together in operative relationship;

said first section of the terminal apparatus including:

a. an upstanding back and a low front portion projecting forward from the lower portion of said upstanding back;

b. said low front portion having a support deck thereon;

c. input/output means for connection to other equipment;

d. data memory means for storing data and microprocessor means for sequencing the operation of the terminal apparatus;

e. read out display means with a display screen positioned in said upstanding back portion for displaying data;

f. first circuit means for carrying data connected to said data memory means and microprocessor means, said input/output means, said read out display means and said first detachable connector means;

said second section of the terminal apparatus being adapted to be removably mounted upon said support deck in a

predetermined position thereon with said second electrical connector means mating with said first electrical connector means when said second section is mounted in said predetermined position on said deck, said second section including:

g. a keyboard arranged for convenient use in performing a particular management application for entering data into said memory means relating to that particular management application;

h. prompting means for prompting a human operator in the correct use of the keyboard for entering particular data as instructed by said prompting means to be in proper order for that particular management application;

i. application program memory means pre-programmed for that particular management application for controlling the operation of said terminal apparatus to perform that particular management application;

j. second circuit means for carrying data connected to said second detachable connector means, said keyboard, said prompting means, and said application program memory means;

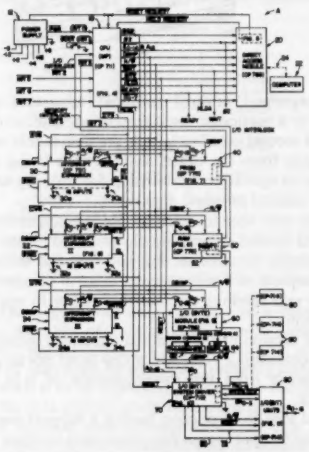
whereby when said second section is mounted upon said support deck of said first section with said first and second electrical connector means mated together, said management control terminal apparatus has a keyboard which is conveniently arranged for use in performing a particular management application, and the terminal apparatus is operationally and functionally completed and specifically adapted for conveniently carrying out that particular management application.

4,107,785

PROGRAMMABLE CONTROLLER USING MICROPROCESSOR

William H. Seipp, Bettendorf, Iowa, assignor to Gulf & Western Industries, Inc., New York, N.Y.

Filed Jul. 1, 1976, Ser. No. 701,858
Int. Cl.[2] G06K *7/01*
U.S. Cl. 364—900 **7 Claims**



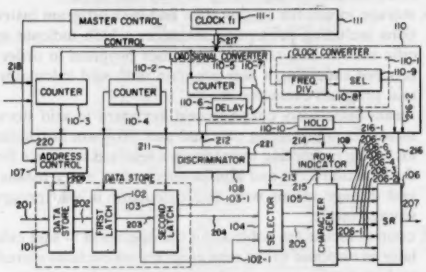
1. A programmable controller of the type using a microprocessor having a plurality of bi-directional data terminals and a plurality of address terminals upon which a binary code address of bits appears, said controller including: a set of data lines, data input means for applying a byte of binary data on said set of data lines, said byte having a given bit on one of said data lines to be applied to a selected one of said data terminals for processing by said microprocessor; a first logic decoder means connected to said set of data lines for selecting said given bit of said byte on said one of said data lines in response to logic on said address terminals; said first logic decoding means having an output for receiving said selected bit; and, second logic network means for applying said bit selected by logic on said address terminals and received by said decoder output to said selected one of said data terminals of said microprocessor for bit processing by said microprocessor of binary logic on said selected terminal.

4,107,786

CHARACTER SIZE CHANGING DEVICE

Katsumi Masaki, Kodaira, and Yukio Inagi, Isaka, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 24, 1977, Ser. No. 771,468
Claims priority, application Japan, Mar. 1, 1976, 51-21911
Int. Cl.[2] G06F *3/12, 3/14*
U.S. Cl. 364—900 **23 Claims**



1. A character size changing device comprising:

(a) pattern signal output means responsive to an input information signal for developing pattern signals;

(b) pattern output means responsive to the pattern signals developed from said pattern signal output means for producing visible character patterns;

(c) storage means for storing therein information signals to be applied to said pattern signal output means and instruction signals for designating a part of the visible patterns to be produced by said pattern output means and specifying the size of the visible patterns;

(d) read-out means for reading out information and instruction signals stored in said storage means;

(e) transmission means for transmitting the information signals read out from said storage means to said pattern signal output means;

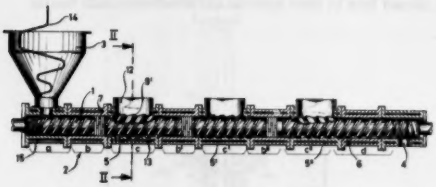
(f) discrimination means for discriminating the presence of an instruction signal in the signals read out from said storage means; and

(g) control means for controlling said pattern signal output means to cause, when no instruction signal is discriminated by said discrimination means, said pattern signal output means to develop all the pattern signals corresponding to a read-out information signal and to cause, upon detection of a read-out instruction signal, the pattern signal output means to develop a part of the pattern signals corresponding to the part of the visible pattern designated by the discriminated instruction signal.

4,107,787
SCREW EXTRUDER FOR CONTINUOUSLY PROCESSING AND DEGASING OF ELASTOMERS AND POLYMERS HAVING A VISCOSITY OF MORE THAN 1,000 POISE

Herbert Ocker, Leonberg, Fed. Rep. of Germany, assignor to Werner & Pfleiderer, Stuttgart, Fed. Rep. of Germany

Filed Mar. 18, 1977, Ser. No. 778,943
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1976, 2612827
Int. Cl.² B29B 1/10
U.S. Cl. 366—75 10 Claims



1. A screw extruder for continuously processing and degasing elastomers and polymers having a viscosity of more than thousand poise, said screw extruder comprising:

an elongate casing defining a lengthwise inner space and having at one end an input zone and at the other end a discharge zone;

at least one extruder screw having flights along its length rotatably mounted in said casing along the length thereof,

degasing zones lengthwise spaced within said casing space between said input and discharge zones;

pressure means in the space within the casing and disposed upstream of each of said degasing zones;

kneading and shear means disposed upstream of each of said degasing zones;

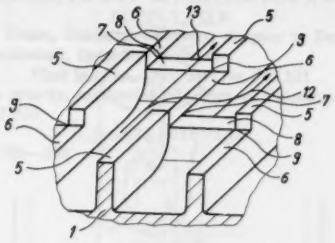
said casing having in its inside wall juxtaposed to the degasing zones and limited in length by the kneading and shear means a plurality of spirally grooved portions, one portion for each degasing zone, each portion having a plurality of spiral grooves, the pitch and the depth of said spiral grooves being at most equal to the depth of the flights on the extruder screw, the spiral grooves of each portion extending along the entire length of the respective degasing zone.

4,107,788
EXTRUDER SCREW

Dietmar Anders, Hanover, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hanover-Kleefeld, Fed. Rep. of Germany

Filed Feb. 24, 1977, Ser. No. 771,642
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1976, 2608307
Int. Cl.² B29B 1/06
U.S. Cl. 366—81 3 Claims

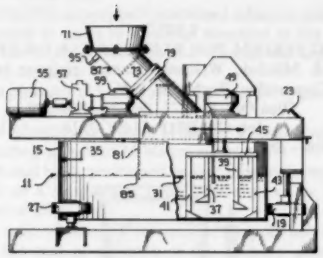
1. An extruder screw for the processing of the thermoplastics, natural rubber and other elastomeric materials, comprising a screw core and a plurality of webs spiralling around said core and forming a thread therein, wherein, for at least the blender section of the length of the extruder screw, each web has alternating lengths of lower height and lengths of greater height; transverse webs extending between adjacent webs, said transverse webs being positioned approximately at the end of a web length of greater height in one web and the beginning of a web length of greater height in the adjacent web, said transverse webs being of approximately the same height as said web lengths of lower height.



4,107,789
METHOD AND APPARATUS FOR UNIFORMLY PNEUMATICALLY DISPERSING MATERIAL

Robert McDowell, Aiken County, S.C., assignor to Bevil J. Kilgore, Sheffield, Ala. and James H. Backus, Alexandria, Va.

Filed Jan. 28, 1976, Ser. No. 653,024
Int. Cl.² B01F 15/02, 9/12; B28C 5/06
U.S. Cl. 366—3 11 Claims



1. The method of uniformly dispersing dry additive material into aggregate receiving material comprising the steps of:

entraining the additive material in air;

conducting the entrained material to a predetermined size surface area of the receiving material while,

confining the entrained material to a closed space between a source of said additive material and said receiving material to form a cloud of additive material particles impinging on said predetermined size surface of the aggregate receiving material; and

agitating the receiving material at said surface area to present new surface areas of receiving material to said entrained material.

4,107,790
ULTRASONIC CLEANING APPARATUS

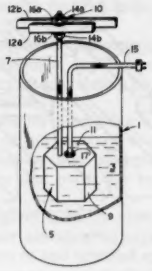
James W. McCord, 9101 Nottingham, Louisville, Ky. 40222

Filed Sep. 30, 1977, Ser. No. 838,146
Int. Cl.² B08B 3/12
U.S. Cl. 366—127 4 Claims

1. An ultrasonic cleaning apparatus comprising:

(a) a container for a liquid having an open top;

(b) an enclosed vibrating housing disposed within said container, said housing having at least three sides;



(c) at least one ultrasonic transducer attached to the inner surface of each side; and,

(d) means for providing electrical energy to said transducer.

4,107,791

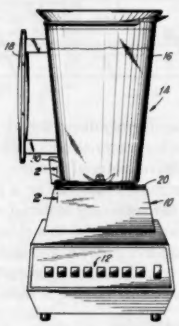
LOCKING SYSTEM FOR BLENDER JAR OR THE LIKE

Murray M. Mikituk, Welland, Canada, assignor to General Signal Corporation, Rochester, N.Y.

Filed Oct. 3, 1977, Ser. No. 838,596

Int. Cl.² B01F *13/04, 7/16*

U.S. Cl. 366—205 **5 Claims**



1. In a blender device having a blender jar assembly, which includes a blender jar engaged in a holder, adapted to be mounted on a base or console, the improvement of a locking system for preventing the jar from disengaging from its holder during blender operation, comprising

a flange member near the bottom of said jar, and an elongated locking pin held loosely in a opening in said holder such that, in the normal upright orientation for the jar assembly, the pin drops down so that the jar is free to rotate in either direction in its holder, but when the assembly is placed on the base or console, said pin is forced upwardly by the base and thereby acts as a barrier to the flange member so as to prevent rotation of said jar.

4,107,792

APPARATUS FOR DISCONTINUOUS MIXING OF AT LEAST TWO MATERIALS

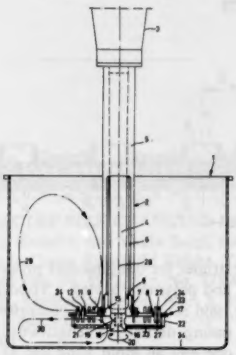
Herbert Durr, Mannheim, Germany, assignor to Draiswerke GmbH, Mannheim-Waldhof, Germany

Filed Jun. 16, 1977, Ser. No. 807,391

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1976, 2627600

Int. Cl.² B01F *7/16*

U.S. Cl. 366—302 **8 Claims**



1. In an apparatus for discontinuous mixing of at least two substances, of which at least one is a liquid, the apparatus including a container, a mixer disposed in the container, the mixer having a rotor drivable at high speed through a shaft and having a stator, and respective teeth disposed on the rotor and on the stator in mutually concentric circular planes for movement past one another to form shearing slots, the improvement wherein at least those teeth located most outward radially on said rotor are disposed in a circular plane outside that plane in which those of said teeth on said stator which are most radially outwardly positioned are located and wherein said teeth on said stator and said rotor are mounted respectively on mutually concentric annular disks of said stator and of said rotor with a small radial distance between said teeth on said rotor and said teeth on said stator, in adjacent circumferential planes and wherein said teeth extend to both sides of said corresponding annular disks.

4,107,793

MIXER APPARATUS FOR CONTINUOUSLY COAGULATING AN AQUEOUS LATEX AND CONSOLIDATING AS A PASTE COAGULUM

James L. Wallace, Wilbraham, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed May 26, 1977, Ser. No. 800,836

Int. Cl.² B01F *7/16*

U.S. Cl. 366—312 **13 Claims**

1. A mixer apparatus for continuously coagulating an aqueous polymeric latex and consolidating as a paste coagulum comprising:

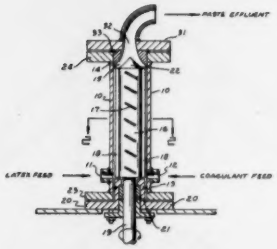
(A) a generally cylinderical barrel having first and second feed port means in a first end portion thereof and a discharge port defined in the opposed second end portion thereof, the interior length of said barrel being greater than the interior diameter thereof,

(B) a rotor means generally extending through and coaxial with said barrel,

(C) at least two diametrically opposed longitudinally extending rows of tab blades affixed to said rotor means each tab blade having a radial projection from said rotor means and being angled relative to the axis of said rotor means so as to convey the coagulum toward said discharge port, said

opposed rows of tab blades are so arranged that the individual blades of one row are positioned opposite to the openings between blades on the opposed row so that substantially the entire interior surface of said barrel along its length are wiped by the opposed rows of blades during operation of said apparatus,

(D) at least two diametrically opposed wiper densifier blades affixed to said rotor means each wiper blade having a radial projection from said rotor means and extending along the length thereof wherein said wiper blades have a leading surface tangential to said rotor rising to a predetermined clearance with the interior wall of said barrel, said



wiper blade having a rounded following surface taking a curvature parallel to said rotor,

(E) a journal means, being an axial extension of said rotor permitting rotational movement of said rotor means relative to said barrel,

(F) a feed end closure means, and

(G) the relationship between said barrel, said rotor, said blades, said ports, said journal and said feed end closure means being such that during operation of said apparatus, said paste coagulum can output from said discharge port means when said latex is input to said first port means and a coagulant is input to said second port means.

4,107,794

MIXING BED PICK UP APPARATUS FOR A STAPLE SUPPLY PILE

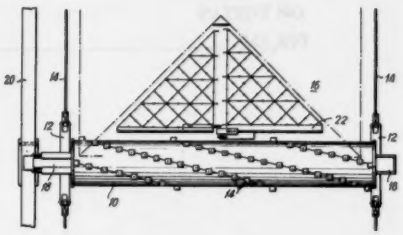
Joachim Ruder, Duisburg, Germany, assignor to DeMag Aktiengesellschaft, Duisburg, Germany

Filed May 16, 1977, Ser. No. 797,131

Claims priority, application Fed. Rep. of Germany, May 18, 1976, 2622115

Int. Cl.[2] B01F *15/02*

U.S. Cl. 366—346 **1 Claim**



1. Apparatus for picking up and delivering incrementally and continuously representative portions of a pile of staple supply materials, comprising

(a) a rotary pipe pickup device positioned adjacent the base of a supply pile;

(b) a plurality of pickup blades positioned on said pipe, said blades positioned in spiral patterns around the circumference of said pipe;

(c) a reversible supply belt positioned adjacent said pipe, and mounted to move in the same direction as the spiral pattern on said pipe, or opposite thereto; the improvement characterized by

(d) said plurality of blades spaced evenly from each other on said pipe in said spiral pattern;

(e) said plurality of blades arranged in four longitudinally extending spirals of 24 blades each;

(f) each said blade positioned on said pipe with respect to the front of a supply pile being delivered at an embracing angle of 270°; and

(g) the ratio of velocity between said supply belt movement and the rate of advance of the delivery points of said plurality of blades is 0.6.

DESIGN PATENTS

GRANTED AUG. 15, 1978

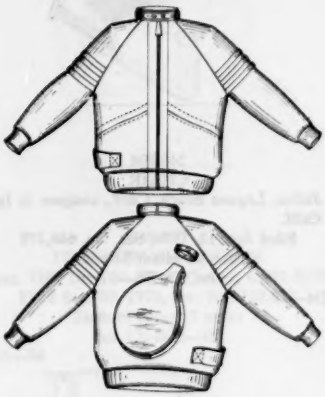
ERRATA

For CLASS	See PATENT NO.
D23–020	248,897

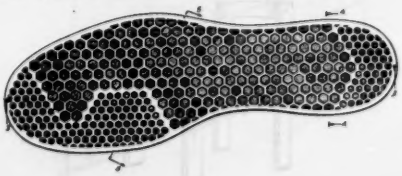
DESIGNS

AUGUST 15, 1978

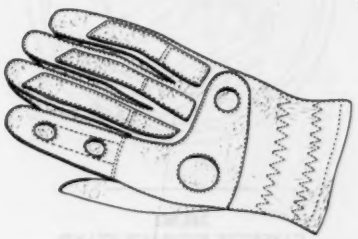
248,896
JACKET
Robert Steven Hasday, 440 W. 34th St., New York, N.Y. 10001; Carmen Lodico, 32 Gramercy Park South, Apt. 16G, and Lloyd Greenleaf, 32 Gramercy Park South, both of New York, N.Y. 10013
Filed Oct. 8, 1976, Ser. No. 730,816
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—184



248,897
SOLE FOR FOOTWEAR
Carl Russell Toothaker, Woodbridge, Conn., assignor to Uniroyal, Inc.
Filed Oct. 8, 1976, Ser. No. 730,893
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—320



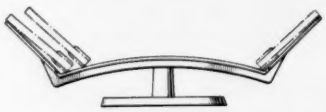
248,898
GLOVE
Carmen D. DeLeone, Cornwells Heights, Pa.; Ruth West, Evergreen, Colo., and Anthony DiStefano, Morrisville, Pa., assignors to Engine Specialties, Inc., Columbus, Ohio
Filed Nov. 24, 1976, Ser. No. 744,589
Term of patent 14 years
Int. Cl. D2—*06*
U.S. Cl. D2—361



248,899
DOCUMENT BELT
Axel de Neufville, 34 Boulevard Edouard Herriot, 13008 Marseille, France
Filed Sep. 10, 1976, Ser. No. 721,931
Claims priority, application France, Apr. 26, 1976, 76 4253
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—383

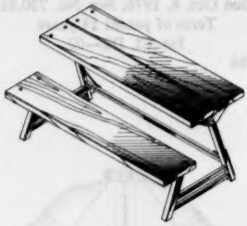
248,900
TRAIN RING
Diane Weitzbuch, 7533 Spring Lake Dr., Bethesda, Md. 20034
Filed Jul. 13, 1976, Ser. No. 704,941
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—401

248,901
CASSETTE STORAGE STAND
Happy Hugh Unfried, Long Beach, Calif., assignor to Intermagnetics Corporation, Santa Monica, Calif.
Filed Oct. 28, 1976, Ser. No. 736,442
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—25



248,902
PEDESTAL TABLE
Michael Neels, 3046 Marna, Long Beach, Calif. 90808
Filed Sep. 30, 1976, Ser. No. 728,393
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—29

248,903
CONVERTIBLE PICNIC TABLE
Robert L. O'Connor, 11133 Harrison Rd., Osceola, Ind. 46561
Filed Sep. 2, 1976, Ser. No. 719,923
Term of patent 14 years
Int. Cl. D6—*05*
U.S. Cl. D6—45

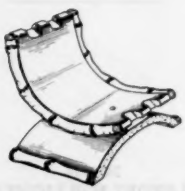


248,904
CHAIR
Emile E. Julian, Laguna Beach, Calif., assignor to Ipolar, Inc., Irvine, Calif.
Filed Jan. 12, 1976, Ser. No. 648,279
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—69

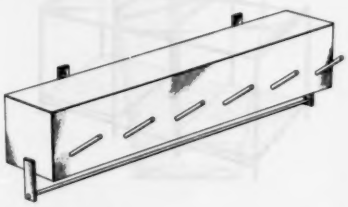
248,905
CHAIR
Armin E. Schoeller, 4271 SE. Marine Dr., Burnaby, B. C., Canada
Filed Aug. 20, 1976, Ser. No. 716,214
Claims priority, application Canada, Feb. 24, 1976, 2402761
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—78

248,906
COMBINED SOAP HOLDER AND TOWEL RING
Rodney A. Johnson, 2140 Monroe St., Apt. 110, Hollywood, Fla. 33020, and Francis W. Selby, Box 170, R.D. #1, Middletown, Del. 19709
Filed Oct. 18, 1976, Ser. No. 733,462
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—90

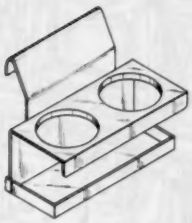
248,907
TOOTHBRUSH HOLDER
Nelson Yang, 1240 Dore St., West Covina, Calif. 91792
Filed Sep. 30, 1976, Ser. No. 728,422
Term of patent 7 years
Int. Cl. D23—*02*
U.S. Cl. D6—94



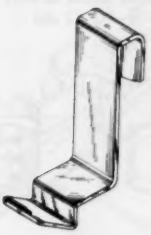
248,908
COAT RACK
Douglas A. Robinson, 806 Ariege Dr., Creve Coeur, Mo. 63141
Filed Dec. 7, 1976, Ser. No. 748,390
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—116



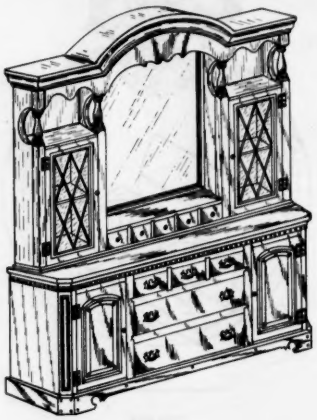
248,909
HOLDER FOR POTTED PLANTS TO BE USED IN AUTOMOBILES
Nicholas Frazian, Hebron, N.H. 03241
Filed Feb. 17, 1977, Ser. No. 762,033
Term of patent 7 years
Int. Cl. D6—*06*; D7—*99*
U.S. Cl. D6—137



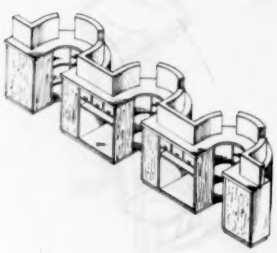
248,910
HANGER FOR POTTED PLANTS
Francis DeFilippo, 2525 Creighton Dr., Golden, Colo. 80401
Filed Jul. 28, 1977, Ser. No. 819,670
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—137



248,911
COMBINATION DRESSER AND MIRRORED HUTCH
David M. Handel, Union, N.J., assignor to The Bennington Company, Union, N.J.
Filed Mar. 15, 1976, Ser. No. 666,632
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—154



248,912
MULTIPLE POSITION SERVICE COUNTER UNIT
Vernon C. Canfield, Bainbridge Island, Wash., and Charles F. Anderson, San Marino, Calif., assignors to Pacific National Bank of Washington, Seattle, Wash.
Filed Sep. 30, 1976, Ser. No. 728,389
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—157



248,913
CABINET OR SIMILAR ARTICLE
Anthony John Robinson, Woollahra, Australia, assignor to Framac Industries Pty. Limited, Gransville, Australia
Filed Sep. 21, 1976, Ser. No. 725,077
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—158

248,914
COMBINED SUPPORT FOR LIGHT SOURCE AND TABLE FOR POTTED PLANTS OR THE LIKE
Ollie H. Ettress, 5238 Garfield, Kansas City, Mo. 64130
Filed Jun. 21, 1976, Ser. No. 698,477
Term of patent 14 years
Int. Cl. D26—*04, 05*
U.S. Cl. D6—175

248,915

BAKER'S TABLE OR SIMILAR ARTICLE

Carl Brandenfels, Scappoose, Oreg., assignor to H. T. Products, Inc., Scappoose, Oreg.

Filed Sep. 29, 1976, Ser. No. 727,968

The portion of the term of this patent subsequent to Dec. 9, 1989, has been disclaimed.

Term of patent 14 years

Int. Cl. D6—*03*

U.S. Cl. D6—179

248,916

BEVERAGE CAN OR SIMILAR ARTICLE

William G. Reynolds, 5115 Cary Street Rd., Richmond, Va. 23226, and Horst F. W. Arfert, 1527 Westshire La., Richmond, Va. 23233

Filed Jun. 16, 1976, Ser. No. 696,857

Term of patent 14 years

Int. Cl.[2] D7—*01*

U.S. Cl. D7—15

248,917

INSULATED PITCHER

Yoshito Kikuchi, 1033 Hayamicho, Kadoma, Osaka Prefecture, Japan 571

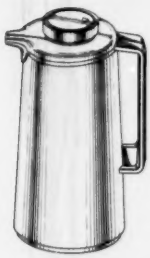
Filed Aug. 16, 1976, Ser. No. 714,683

Claims priority, application Japan, May 14, 1976, 51-118143

Term of patent 14 years

Int. Cl. D7—*01*

U.S. Cl. D7—65



248,918

FRUIT KNIFE

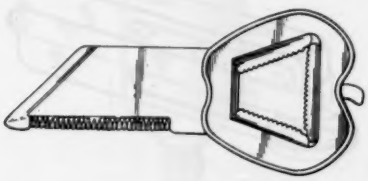
Nihachi Kudo, No. 13-10, Konakano kito 5 chome, Hachinohe-shi, Aomori-ken, Japan

Continuation-in-part of Ser. No. 545,455, Jan. 30, 1975, Pat. No. Des. 242,422. This application May 26, 1976, Ser. No. 690,333

Term of patent 14 years

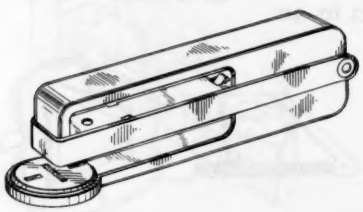
Int. Cl. D7—*03*

U.S. Cl. D7—143

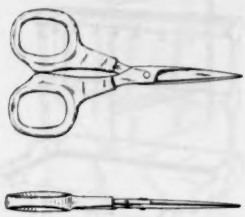


248,919
PLANT GROWTH CONTROL STAKE
J. Frank Schmidt, Jr., 19343 NE. Halsey St., Portland, Oreg. 97230
Filed Oct. 1, 1975, Ser. No. 618,483
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D8—1

248,920
STAPLER
Grete Jalk, Skodsborg, and Jørgen Gammelgård, Alberts Lund, both of Denmark, assignors to Swingline, Inc., Long Island City, N.Y.
Filed Mar. 5, 1976, Ser. No. 664,287
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D8—50



248,921
SCISSORS
William C. Ferguson, Denville, N.J., assignor to Cooper Industries, Inc., Houston, Tex.
Filed Nov. 22, 1976, Ser. No. 743,905
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—57

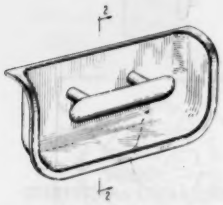


248,922
TOOL HANDLE WITH SCREWDRIVER
Frank M. Osak, Jr., Shelton, Conn., assignor to Shelton Products, Inc., Shelton, Conn.
Filed Mar. 7, 1977, Ser. No. 774,750
Term of patent 14 years
Int. Cl. D8—*04*
U.S. Cl. D8—82

248,923
HANDLE FOR FURNITURE DOORS, DRAWERS OR THE LIKE

Roland Spellier, Lemgo, Fed. Rep. of Germany, assignor to Firma Richard Heinze GmbH & Co. KG, Fed. Rep. of Germany

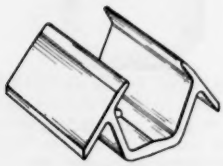
Filed Jan. 30, 1976, Ser. No. 653,855
Claims priority, application Fed. Rep. of Germany, Aug. 1, 1975, 6 AR 138/75
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—313



248,924
CLIP FOR ROOFING SHEETS

Christopher John Curtis, Melbourne, Australia, assignor to Comalco Products Pty. Limited, Melbourne, Australia

Filed Jan. 22, 1976, Ser. No. 651,582
Claims priority, application Australia, Aug. 29, 1975, 67675
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—394



248,925
BOTTLE

Allen H. Howland, 60 Creston Way, Warwick, R.I. 02886

Filed Mar. 19, 1976, Ser. No. 668,777
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—117

248,926
BOTTLE OR SIMILAR ARTICLE

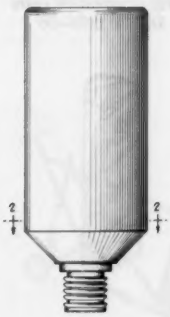
Thomas A. Furlong, Wayne, N.J., and Charles D. Goldstein, Monsey, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jun. 3, 1976, Ser. No. 692,253
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—143

248,927
BOTTLE

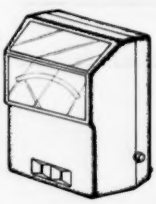
Antonio Macchi Cassia, Milan, Italy, assignor to Steiner American Corporation

Filed Jun. 1, 1976, Ser. No. 691,847
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—158



248,928
MAGNETIC WEIGHING SCALE
Jerome A. Grunstad, West St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Oct. 4, 1976, Ser. No. 729,478
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—91

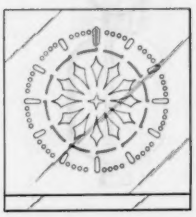
248,929
WATT METER HOUSING
Jackson Connolly, Fremont, Calif., assignor to Watt Watchers, Inc., Lafayette, Calif.
Filed Jun. 24, 1976, Ser. No. 699,517
Term of patent 3 years
Int. Cl. D10—*04*
U.S. Cl. D10—102



248,930
ULTRASONIC INTRUSION DETECTOR
William G. Kahl, Jr., Brookfield, Conn., assignor to Arrowhead Enterprises, Inc., New Milford, Conn.
Filed Feb. 16, 1977, Ser. No. 769,209
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—106

248,931
DIAL FOR CLOCK
Kenji Nakamura, Kamakura, Japan, assignor to L C Chemical Company Limited, Tokyo, Japan
Filed Aug. 25, 1975, Ser. No. 607,459
Claims priority, application Japan, Mar. 28, 1975, 50-12225
The portion of the term of this patent subsequent to Aug. 15, 1992, has been disclaimed.
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—125

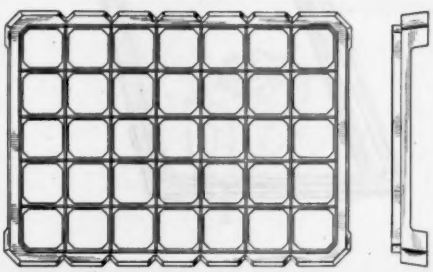
248,932
DIAL FOR CLOCK
Kenji Nakamura, Kamakura, Japan, assignor to L C Chemical Company Limited, Tokyo, Japan
Filed Aug. 25, 1975, Ser. No. 607,460
Claims priority, application Japan, Mar. 7, 1975, 50-8953
The portion of the term of this patent subsequent to Aug. 15, 1992, has been disclaimed.
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—125



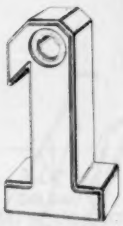
248,933
PENDANT
Albert Lipten, New City, N.Y., assignor to Cyrano Creations, Inc., New York, N.Y.
Filed Mar. 3, 1976, Ser. No. 663,473
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—81

248,934
CHRISTMAS ORNAMENT
William B. Campbell, St. Paul, Minn., assignor to Ball Corporation, Muncie, Ind.
Filed Mar. 1, 1976, Ser. No. 662,758
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—121

248,935
HORTICULTURAL TRAY
Kenneth R. Stutelberg, Bloomington, and Dennis C. Anderson, Northfield, both of Minn., assignors to National Polymers, Inc., Lakeville, Minn.
Filed Mar. 26, 1976, Ser. No. 670,659
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—155



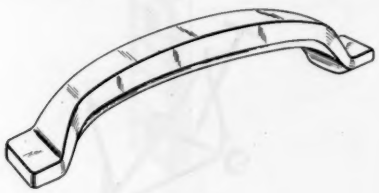
248,936
TROPHY
William D. Lohan, 850 Ellis Ave., Orangeburg, S.C. 29115
Filed Jan. 19, 1977, Ser. No. 760,756
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—157



248,937
CART FOR TRANSPORTING COLLAPSIBLE TABLES
Henry D. Figueroa, 1011 Magnolia Ave., Yuma, Ariz. 85364
Filed Apr. 22, 1977, Ser. No. 789,951
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—26

248,938
COLLAPSIBLE BABY CARRIAGE
Angus Christopher Firth; Frederick John Sheldon, both of Shipley; John Atherton, and William John Block, both of Leeds, all of England, assignors to Lawrence Wilson & Son Limited, Leeds, England
Filed Mar. 18, 1977, Ser. No. 779,410
Term of patent 14 years
Int. Cl. D12—*12*
U.S. Cl. D12—129

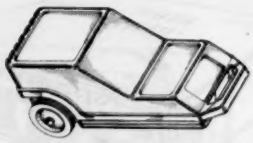
248,939
ANTI-SKID BAR FOR POWER DRIVEN VEHICLES
Göran Eriksson, Rundviksverken, Sweden, assignor to Masonite AB, Rundviksverken, Sweden
Filed Jun. 18, 1976, Ser. No. 697,432
Claims priority, application Sweden, Feb. 3, 1976, 76216
Term of patent 14 years
Int. Cl.[2] D12—*16*
U.S. Cl. D12—154



248,940
MOTORCYCLE FAIRING
Charles A. Saunders, IV, Columbus, Nebr. 68601
Filed Jul. 22, 1977, Ser. No. 818,115
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—182

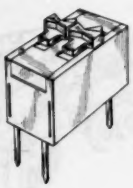
248,941
VEHICLE WINDOW FRAME
Karl Ingvar Carlsson, and Sven Torsten Åkesson, both of Tidaholm, Sweden, assignors to AB Bofors, Bofors, Sweden
Filed Oct. 4, 1976, Ser. No. 729,313
Claims priority, application Sweden, Apr. 5, 1976, 760768
Term of patent 14 years
Int. Cl. D12—*16*; D25—*02*
U.S. Cl. D12—183

248,942
COMBINED MOBILE BATTERY CHARGER AND CARRYING UNIT THEREFOR
Terry W. Kniss, 14430 18th S.W., Seattle, Wash. 98166
Filed Nov. 8, 1976, Ser. No. 739,421
Term of patent 14 years
Int. Cl. D13—*02*
U.S. Cl. D13—7



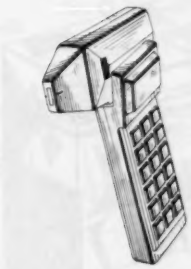
248,943
INSULATOR FOR AN OPEN COIL ELECTRIC HEATING UNIT
Reynold C. King, 865 N. 18th St., Wytheville, Va. 24382
Filed Dec. 13, 1976, Ser. No. 752,423
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—18

248,944
ELECTRICAL SWITCH
Nelson Frederick Godfrey, 36 Holywell Rd., Studham, Bedfordshire, England
Filed Dec. 1, 1975, Ser. No. 636,466
Claims priority, application United Kingdom, Oct. 2, 1975, 972743/75; Oct. 2, 1975, 972747/75; Oct. 2, 1975, 972744/75; Oct. 2, 1975, 972745/75; Oct. 2, 1975, 972746/75
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—32

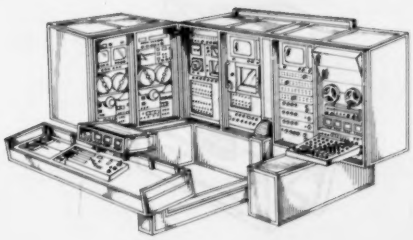


248,945
ILLUMINATED MICROPHONE HOLDER
Thomas R. Astleford, 6203B 153rd St., Grandview, Mo. 64030, and James E. Stout, 500 Webb Rd., Raymore, Mo. 64083
Filed Jul. 21, 1976, Ser. No. 707,696
Term of patent 14 years
Int. Cl. D14—*01, 99*
U.S. Cl. D14—13

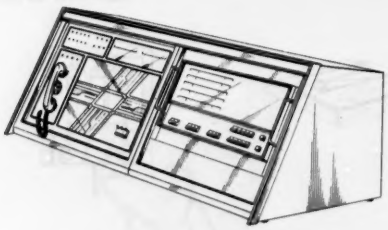
248,946
HAND SCAN UNIT
Robert B. Koenig, Dallas, Tex., assignor to Recognition Equipment Incorporated, Dallas, Tex.
Filed Dec. 27, 1976, Ser. No. 754,851
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—40



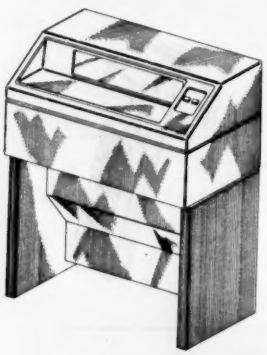
248,947
VIDEO PRODUCTION MODULE
William G. Graham, Las Vegas, Nev., assignor to Las Vegas Convention Service Co.
Filed Jul. 21, 1975, Ser. No. 597,951
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—42



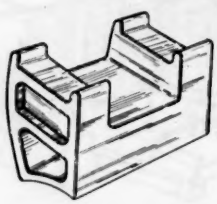
248,948
CONSOLE CABINET
Thomas W. Seabury, 3300 Crow Canyon Rd., San Ramon, Calif. 94583
Filed Nov. 22, 1976, Ser. No. 743,676
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—42



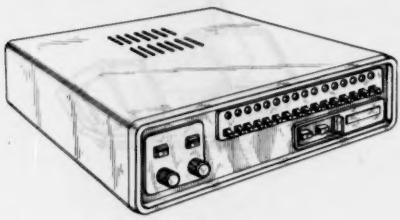
248,949
PRINTER HOUSING OR SIMILAR ARTICLE
Andrew L. Alger, Wilmette, Ill., assignor to Computer Peripherals, Inc.
Filed Oct. 12, 1976, Ser. No. 731,403
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—50



248,950
AUXILIARY TELEPHONE-RECEIVER SADDLE
Richard L. Vitacco, 1653 Thurston Ave., Racine, Wis. 53405
Filed Apr. 9, 1976, Ser. No. 675,588
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—59

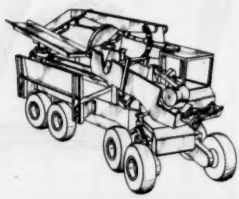


248,951
PROGRAMMABLE SCANNING RADIO RECEIVER OR THE LIKE
Kazuyoshi Imazeki, Tokyo, Japan, assignor to General Research of Electronics, Inc., Tokyo, Japan
Filed Apr. 5, 1976, Ser. No. 673,455
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—71

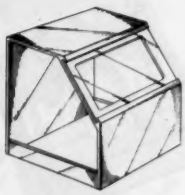


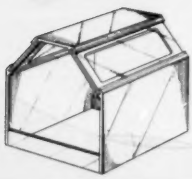
248,952
COMBINED RADIO RECEIVER AND TAPE PLAYER
Susumu Yamamoto, Moriguchi, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Feb. 11, 1976, Ser. No. 657,336
Claims priority, application Japan, Nov. 20, 1975, 50/46225
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—72

248,953
TREE HARVESTER
Olli Aho, Tampere; Timo Hartman, Pirkkala; Jouko Hyytianien, Tampere; Matti Kaarnametsa, Tampere; Jukko Moisander, Tampere; Markku Makela, Tampere, and Kari Rikkonen, Tampere, all of Finland, assignors to Rauma-Repola Oy, Lokomon Tehtaat, Finland
Filed Aug. 19, 1976, Ser. No. 715,880
Claims priority, application Finland, Feb. 27, 1976, 76101
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—26



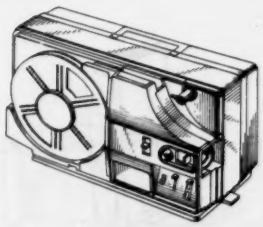
248,954
DUST CATCHER FOR GRINDING OPERATIONS OR THE LIKE
Mesrop Der-Avanessian, 2020 Sunset Blvd., Los Angeles, Calif. 90036
Division of Ser. No. 673,281, Apr. 2, 1976, Pat. No. Des. 244,277, which is a continuation-in-part of Ser. No. 644,536, Dec. 29, 1975, abandoned. This application Feb. 7, 1977, Ser. No. 766,131
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—126



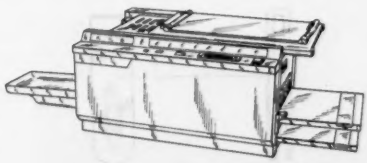


248,955
FEED PIPE TURN
Gerald L. Kitson, 9709 Belding Rd. NE., Rockford, Mich. 49341
Continuation-in-part of Ser. No. 629,866, Nov. 7, 1975, abandoned, which is a continuation of Ser. No. 480,761, Jun. 19, 1974, abandoned, which is a continuation-in-part of Ser. No. 270,316, Jul. 10, 1972, abandoned. This application Jul. 2, 1976, Ser. No. 702,295
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D15—148

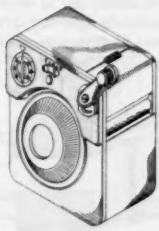
248,956
MOTION PICTURE PROJECTOR
Norman R. Kubnick, Skokie, and Albert L. Nagele, Wilmette, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.
Filed Jul. 8, 1976, Ser. No. 703,396
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D16—23



248,957
ELECTROPHOTOGRAPHICAL DUPLICATOR
Isao Kitai; Matafumi Ikeda, and Tsutomu Yamazaki, all of Osaka, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Mar. 3, 1977, Ser. No. 774,032
Claims priority, application Japan, Sep. 6, 1976, 51/353445
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—31

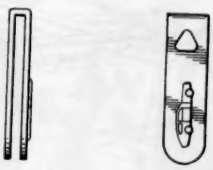


248,958
BULK FILM LOADER OR SIMILAR ARTICLE
Thomas R. Joiner, 149 Osage Ave., Los Altos, Calif. 94022
Filed Jul. 29, 1976, Ser. No. 709,689
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D16—38

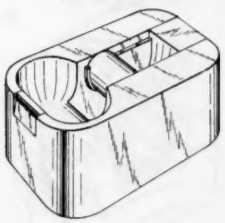


248,959
ELECTRONIC FLASH UNIT
Masahiro Kando, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 2, 1977, Ser. No. 773,710
Claims priority, application Japan, Sep. 7, 1976, 51/35271
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D16—42

248,960
KEY LABEL
Yvonne J. Iverson, 8801 Chowen Ave. South, Minneapolis, Minn. 55431
Division of Ser. No. 562,825, Mar. 28, 1975, Pat. No. Des. 241,539. This application Sep. 23, 1976, Ser. No. 726,639
Term of patent 14 years
Int. Cl. D19—*08*
U.S. Cl. D19—18

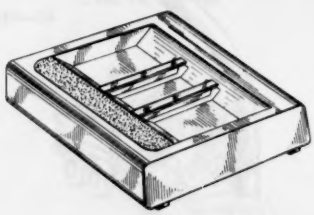


248,961
PRESSURE SENSITIVE ADHESIVE TAPE DISPENSER
Robert J. De brey, Edina, Minn., assignor to Minnesota Mining and Manufacturing Company
Filed Aug. 19, 1976, Ser. No. 715,972
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—69



248,962
FILE CARD HOLDER
Martin Glaubinger, Teaneck, and William L. Effinger, Roseland, both of N.J., assignors to Rolodex Corporation
Filed Sep. 10, 1975, Ser. No. 611,878
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—76

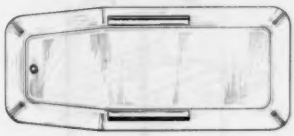
248,963
CARD FILE
William Macowski, Caldwell, N.J., assignor to Ketcham & McDougall, Inc., Roseland, N.J.
Filed Apr. 16, 1976, Ser. No. 677,814
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—76



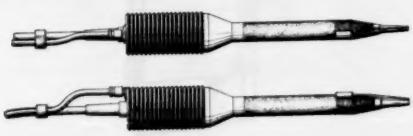
248,964
PHOTOGRAPH DISPLAY
George Kizlauskas, Jamaica, N.Y., assignor to Mele Manufacturing Co., Inc.
Filed Jun. 16, 1976, Ser. No. 696,528
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—76

248,965
AQUARIUM FILTER
Allan H. Willinger, New York, N.Y., assignor to Willinger Bros., Inc., New York, N.Y.
Filed Apr. 26, 1977, Ser. No. 791,165
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—4

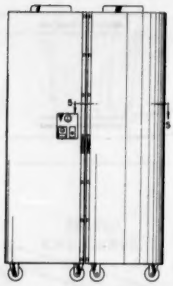
248,966
MATTRESS FOR A TABLE PLATE OF A PATIENT SUPPORTING TABLE
Hans Arne Valentin Johansson, Trehäradsvägen 36, Eslöv, Sweden (241-00)
Filed Jan. 15, 1976, Ser. No. 649,533
Claims priority, application Sweden, Nov. 3, 1975, 2172/75
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—3



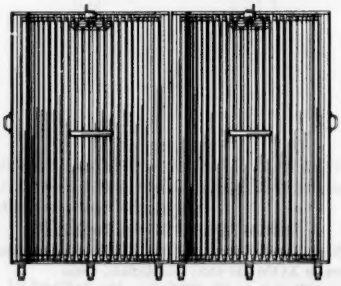
248,967
HIGH SPEED BONE DRILL
John J. Shea, and Harry Phillips, both of Memphis, Tenn., assignors to XOMED Inc., Cincinnati, Ohio
Filed Aug. 18, 1976, Ser. No. 715,235
The portion of the term of this patent subsequent to Sep. 13, 1991, has been disclaimed.
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—28



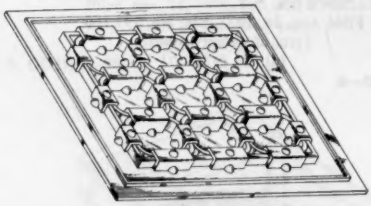
248,968
PHOTOTHERAPY CABINET FOR LONGWAVE ULTRAVIOLET LIGHT TREATMENT
William C. McMillan, Rte. 1, Ozora Rd., Loganville, Ga. 30249
Filed Mar. 12, 1976, Ser. No. 666,482
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—39



248,969
ASPIRATOR TUBE
Joseph Hodge, 1008 Wendover Way, Spartanburg, S.C. 29303
Filed Feb. 27, 1976, Ser. No. 661,963
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—54



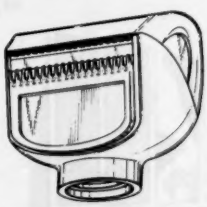
248,970
SPEAKING PORT
William B. Hunt, Redmond, and William H. Heiderich, Seattle, both of Wash., assignors to Simpson Timber Company, Seattle, Wash.
Filed Dec. 20, 1976, Ser. No. 752,563
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—52



248,971
INTERLOCKING MODULE
James Wood, 137 North St., Williamsport, Pa. 17701
Filed May 11, 1976, Ser. No. 685,338
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—94

248,972
WRIST ASH TRAY
Earl C. Carter, P.O. Box 93, Charleston, W. Va. 25321
Filed Aug. 2, 1976, Ser. No. 710,932
Term of patent 14 years
Int. Cl. D27—*03*
U.S. Cl. D27—14

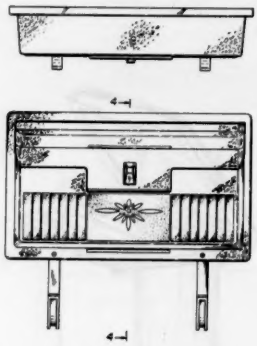
248,973
DETACHABLE ELECTRIC SHAVER HEAD
Shima Ito, Kadoma, Japan, assignor to Matsushita Electric Works, Ltd., Kadoma, Japan
Filed Mar. 3, 1976, Ser. No. 663,606
Claims priority, application Japan, Dec. 16, 1975, 50-49859
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—49



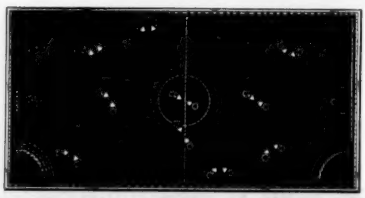
248,974
COMPACT
Pierre Ballereaud, Dammarie, France, assignor to Société Anonyme, "GERMAINE MONTEIL", Paris, France
Filed Jul. 14, 1976, Ser. No. 705,112
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—83

248,975
VERTICAL SECURITY CHEST
David M. Cole, Roanoke, Va., assignor to Tread Corporation, Roanoke, Va.
Filed Jan. 19, 1976, Ser. No. 650,441
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D31—22

248,976
MAILBOX
Jay Raab, 351 W. Broadway, New York, N.Y. 10013
Filed Sep. 10, 1976, Ser. No. 721,974
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D31—24



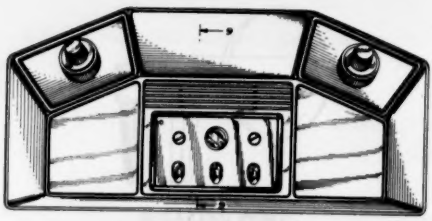
248,977
ELECTRONIC GAME PANEL OF SOCCER OR THE LIKE
H. Frank Fogleman, San Diego, Calif., assignor to Gremlin Industries, Inc.
Filed Jun. 25, 1976, Ser. No. 699,620
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



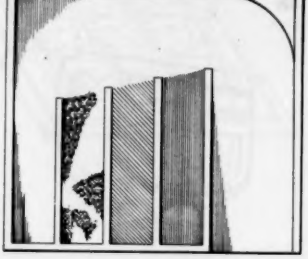
248,978
SPRING-SUPPORTED BOWL PLAYGROUND APPARATUS
Dwight C. Shaneour, Hillsdale, Mich., assignor to Quality Industries, Inc.
Filed Aug. 24, 1976, Ser. No. 717,466
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5 L

248,979
GOLF CLUB CARRIER
John L. Findeisen, 11026 S. Avenue L, Chicago, Ill. 60617
Filed Mar. 17, 1976, Ser. No. 667,902
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 GB

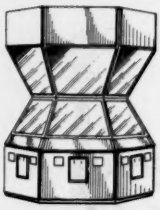
248,980
ELECTRONIC CABINET FOR A VIDEO GAME
Alan H. Friedman, Milburn, N.J., assignor to APF Electronics, Inc., New York, N.Y.
Filed Sep. 27, 1976, Ser. No. 726,722
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 R



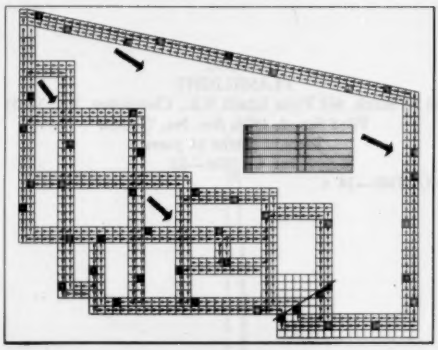
248,981
BALL GAME BOARD
Peter Lombardo, 738 Allen Ave., Vineland, N.J. 08360
Filed Sep. 20, 1976, Ser. No. 724,527
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



248,982
GAME CABINET
David M. Cook, San Jose, Calif., assignor to Atari, Inc. (Delaware Corporation), Sunnyvale, Calif.
Filed Oct. 22, 1976, Ser. No. 734,982
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 L

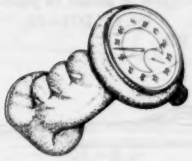


248,983
SAILING GAME BOARD
Eugene Alfred Cavicchi, 186 Wordsworth St., and George Scigliano, 149 Coleridge St., both of East Boston, Mass. 02128
Filed Dec. 27, 1976, Ser. No. 754,105
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



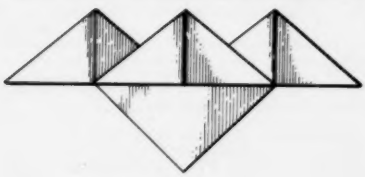
248,984
SET OF CHESSMEN OR SIMILAR ARTICLE
Jeanette Lamonica, and Diana Lamonica, both of 426 Neckar Ave., Staten Island, N.Y. 10304
Filed Mar. 29, 1976, Ser. No. 671,365
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 CH

248,985
COMBINED GRIP AND STOP-WATCH FOR SKI-POLE
Hansruedi Spiri, Biel, Switzerland, assignor to BFG Baumgartner Freres SA, Grenchen, Switzerland
Filed Oct. 1, 1976, Ser. No. 728,533
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—14 D

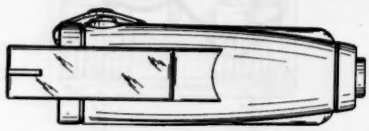


248,986
VOLLEY-BALL OR THE LIKE
Kuniichi Nakata, Hiroshima, Japan, assignor to Myojyo Rubber Industry Co., Inc., Japan
Filed Jul. 22, 1975, Ser. No. 598,019
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—15 EE

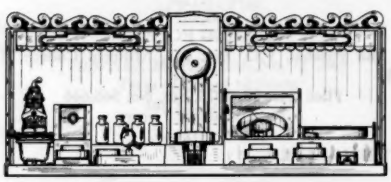
248,987
FOLDING PUZZLE
Mary Ann Paschal, P.O. Box 443, Milligan College, Tenn. 37682
Filed Apr. 10, 1975, Ser. No. 566,666
Term of patent 7 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 M



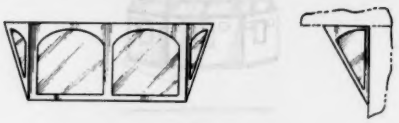
248,988
LAUNCHER FOR TOY AIRCRAFT
Adolph E. Goldfarb, 4614 Monarca Dr., Tarzana, Calif. 91345; Erwin Benkoe, deceased, late of Encino, Calif.; Elisabeth Benkoe, executrix, 17965 Medley Dr., Encino, Calif. 91316; Delmar K. Everitt, Woodland Hills, Calif.; Ronald F. Chesley, La Crescenta, Calif., and Richard D. Frierdich, Canoga Park, Calif., assignors to Adolph E. Goldfarb, Tarzana, Calif. and Elisabeth Benkoe, Encino, Calif., executrix for the estate of Erwin Benkoe
Filed Jan. 5, 1976, Ser. No. 646,520
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 PP



248,989
TOY AMUSEMENT CENTER
Michael C. Cartabiano, Mamaroneck, N.Y., assignor to Child Guidance Playthings, Inc., New York, N.Y.
Filed Sep. 2, 1976, Ser. No. 719,983
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 R



248,990
CABINET FOR A LIGHT SOURCE
Michael D. Iacobelli, 410 Baldwin, Rochester, Mich. 48063
Filed Jun. 12, 1975, Ser. No. 586,371
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—4 B



248,991
FLASHLIGHT
David E. Staub, 461 Palm Island N.E., Clearwater, Fla. 33151
Filed Sep. 1, 1976, Ser. No. 719,980
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—24 A

248,992

BANJO

Geoffrey H. Stelling, 8815 Kenwood Dr., Spring Valley, Calif. 92077

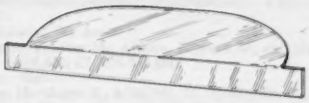
Filed Feb. 24, 1976, Ser. No. 661,037
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D56—1 A

248,993

COVER FOR ORGAN KEYBOARD

Ray J. Oliver, 451 S. 1st St., San Jose, Calif. 95113, and Stanford M. Sammarcelli, 1357 Loyola Dr., Santa Clara, Calif. 95051

Filed Feb. 17, 1976, Ser. No. 658,171
Term of patent 14 years
Int. Cl. D17—*01, 99*
U.S. Cl. D56—2



248,994

ELECTRONIC CALCULATING MACHINE

Matafumi Ikeda, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 28, 1977, Ser. No. 791,869
Claims priority, application Japan, Nov. 10, 1976, 51-44413
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11 B

248,995

ELECTRONIC CALCULATING MACHINE

Shigetoshi Hazama; Seiichiro Nishiguchi, and Yoshiaki Kobayashi, all of Osaka, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 23, 1977, Ser. No. 809,095
Claims priority, application Japan, Dec. 29, 1976, 51-51448
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11 B

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 15TH DAY OF AUGUST, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A-T-O Inc.: *See*—
August, William S., 4,106,816, Cl. 301-108.00R.

Aarons, Raymond Joseph, to Monier Colourtile Pty. Ltd. Tiling system for roofs. 4,106,253, Cl. 52-547.000.

AB Bonnierforetagen: *See*—
Luning, Bjorn Erik Gustav Bertilsson, 4,107,298, Cl. 424-177.000.

Abbott, Joseph: *See*—
Yealy, Carl F.; and Abbott, Joseph, 4,106,963, Cl. 156-73.500.

Abbott Laboratories: *See*—
Biel, John Hans; Bariana, Dilbagh S.; and Fung, Anthony K. L., 4,107,172, Cl. 260-308.00D.

Abe, Takeshi: *See*—
Ukihashi, Hiroshi; Uchino, Tetsuya; Abe, Takeshi; and Kunii, Nobuaki, 4,107,356, Cl. 427-195.000.

Abernethy, Robert R. Fluorescent lamp insert with conductive rod support. 4,107,581, Cl. 315-324.000.

Abrahams, Jacobus Hubertus, to U.S. Philips Corporation. Stirling cycle machine with a control device for supplying working medium. 4,106,293, Cl. 60-521.000.

Abramowitz, Herbert. Pierced earring device. 4,106,310, Cl. 63-12.000.

Accumulatorenwerk Hoppecke Carl Zoellner & Sohn: *See*—
Ruch, Jean, 4,107,396, Cl. 429-26.000.

ACF Industries, Incorporated: *See*—
Behle, Gunter R., 4,106,749, Cl. 251-144.000.

Achard, Jean Claude: *See*—
Percheron born Guegen, Annick; Achard, Jean Claude; Loriers, Jean; Bonnemay, Maurice; Bronoel, Guy; Sarradin, Joel; and Schlapbach, Louis, 4,107,405, Cl. 429-218.000.

Aciers et Outillage Peugeot: *See*—
Roger, Jean, 4,107,584, Cl. 318-227.000.

Ackeret, Peter, to Zyliss Zysset AG. Hand-operated squeezer for extracting the juice from citrus fruits. 4,106,401, Cl. 99-508.000.

Acme General Corporation: *See*—
Kellems, Kenneth K.; and Brydolf, Robert, 4,106,158, Cl. 16-129.000.

Action Leathercraft, Inc.: *See*—
Hillinger, George, 4,106,679, Cl. 224-26.00B.

Adams, Frank H.; and Knapik, H. Peter G., to UOP Inc. Hydrocarbon conversion with a selectively sulfided acidic multimetallic catalytic composite. 4,107,083, Cl. 252-439.000.

Adams, Larry L.: *See*—
Meador, Richard A.; Adams, Larry L.; Cox, Percy T.; Thompson, Larry W.; and Fuchs, James A., 4,107,597, Cl. 324-6.000.
Meador, Richard A.; Adams, Larry L.; Fuchs, James A.; Cox, Percy T.; and Thompson, Larry W., 4,107,598, Cl. 324-6.000.

Adams, Robert Clarence; and Sweigart, James H., to NCR Corporation. Method of fastening metal part to plastic part. 4,106,962, Cl. 156-73.100.

Adcock, Willis A.; and Skaggs, Frank L., to Texas Instruments Incorporated. Two sensor time encoded color imaging system. 4,107,732, Cl. 358-43.000.

Addressograph Multigraph Corporation: *See*—
Holland, Norman, 4,106,408, Cl. 101-401.100.
Roberts, William E., 4,106,871, Cl. 355-99.000.

Adler, Laszlo; Von Cook, K.; Simpson, William A., Jr.; and Lewis, D. Kent, to United States of America, Energy. Anisotropic determination and correction for ultrasonic flaw detection by spectral analysis. 4,106,327, Cl. 73-1.0DV.

Aeritalia S.p.A.: *See*—
Bergman, Burton; and Herman, Stewart M., 4,106,729, Cl. 244-137.00P.

Affimet: *See*—
Bobleter, Andre Henri-Robert; and Simonnet, Jacques Louis-Paul, 4,106,894, Cl. 432-122.000.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
Percheron born Guegen, Annick; Achard, Jean Claude; Loriers, Jean; Bonnemay, Maurice; Bronoel, Guy; Sarradin, Joel; and Schlapbach, Louis, 4,107,405, Cl. 429-218.000.

Agency of Industrial Science & Technology: *See*—
Kataoka, Shoei; Hashizume, Nobuo; and Kodera, Hiroshi, 4,107,718, Cl. 357-3.000.
Watanabe, Ryuji; Sato, Syoichi; and Tomita, Sadami, 4,106,627, Cl. 209-7.000.

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Burgermann, Norbert, 4,106,864, Cl. 352-91.00C.
Burgermann, Norbert, 4,106,865, Cl. 352-91.00C.
Engelsmann, Dieter; Hackenberg, Hubert; and Schubert, Andreas, 4,107,703, Cl. 354-21.000.
Langen, Hans; Ranz, Erwin; Eibl, Johannes; and Wolf, Walther, 4,106,940, Cl. 96-74.000.
Pfeifer, Josef; Paulus, Rudolf; Gutmann, Walter; and Resch, Michael, 4,107,687, Cl. 346-107.00R.

Agusti, Agustin, to J. Uriach & Cia. S.A. Bis(triamcinolone acetonide)-4,4'-methylenebis-(3-methoxy-2-naphthoate). 4,107,161, Cl. 260-239.55D.

Ahrens, Edward W.: *See*—
Brimmer, Frances M.; Ahrens, Edward W.; and Magney, Herbert C., 4,106,620, Cl. 206-363.000.

Airco, Inc.: *See*—
Nayar, Harbhajan S., 4,106,931, Cl. 75-201.000.
Shepherd, Thomas L., 4,107,557, Cl. 310-11.000.

Airway Industries, Inc.: *See*—
Davis, Michael, 4,106,598, Cl. 190-52.000.

Aitken, John; and Graham, William Eric, to J. & P. Coats Limited. Ammonia treatment of textile materials. 4,106,902, Cl. 8-181.000.

Ajinomoto Co., Inc.: *See*—
Komura, Ichiro; Awao, Takeyoshi; and Yamada, Kazuhiko, 4,106,989, Cl. 195-62.000.

Akamatsu, Masahiko, to Mitsubishi Denki Kabushiki Kaisha. Thyristor turn-off system. 4,107,551, Cl. 307-252.00J.

Akamatsu, Masahiko, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor switch. 4,107,552, Cl. 307-252.00J.

Akamatsu, Masahiko: *See*—
Uchida, Ryohei; Utsumi, Satoshi; and Akamatsu, Masahiko, 4,107,772, Cl. 363-124.000.

Akebono Brake Company, Ltd.: *See*—
Kimura, Toshihiko; and Nakayama, Tsuneo, 4,106,595, Cl. 188-73.300.

Akiyama, Keiichi; Kamiuchi, Junichi; Matsuda, Itsuo; and Fujii, Takara, to Toshiba Chemical Products Co., Ltd. Heat-resistant thermosetting polyimide resin. 4,107,153, Cl. 528-322.000.

Akiyoshi, Toshio; Onishi, Tsutomu; and Haikawa, Shozo, to Mitsubishi Denki Kabushiki Kaisha; and Kabushiki Kaisha Terauchi Seisakusho. Clamping tool. 4,106,371, Cl. 81-57.140.

Aktiebolaget IRO: *See*—
Jacobsson, Kurt Arne Gunnar, 4,106,713, Cl. 242-47.010.

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Lagerdahl, Sebastian, 4,106,919, Cl. 55-147.000.

Aktiebolaget Tudor: *See*—
Koch, Kjell, 4,107,407, Cl. 429-225.000.

Akzona Incorporated: *See*—
Fitzner, Josef; and Low, Lothar, 4,106,275, Cl. 57-77.330.
Hewett, Colin Leslie; and Savage, David Samuel, 4,107,206, Cl. 260-562.00R.
Nemeth, Harold C., 4,107,292, Cl. 424-78.000.

Alban, Thomas W.: *See*—
Hyde, Glenn F.; and Alban, Thomas W., 4,106,782, Cl. 277-235.00A.

Albizzati, Enrico: *See*—
Giannini, Umberto; Albizzati, Enrico; and Parodi, Sandro, 4,107,416, Cl. 526-114.000.

Albrande, Alfredo: *See*—
Neri, Filippo; and Albrande, Alfredo, 4,107,683, Cl. 343-18.00E.

Albrecht, Konrad; Frensch, Heinz; and Hartel, Kurt, to Hoechst Aktiengesellschaft. Fungicidal dispersions of a systemic fungicide. 4,107,318, Cl. 424-273.00R.

Albrecht, Werner, to Kabel-und Metallwerke Gutehoffnungshutte AG. Revolving cable-to-housing connection. 4,106,831, Cl. 339-8.00R.

Aldrich, Paul Edward; and Berezin, Gilbert Harvey, to Du Pont de Nemours, E. I., and Company. Antihypertensive hexafluorohydroxyisopropyl benzazepines and benzazocines. 4,107,303, Cl. 424-244.000.

Alexander, Jay M.: *See*—
Kellermeyer, Janet R.; and Alexander, Jay M., 4,106,507, Cl. 128-295.000.

Alford, Andrew. Monitor for localizer antenna arrays. 4,107,688, Cl. 343-108.00R.

Algoship International Limited: *See*—
Campbell, George Thomas Richardson; Kasuga, Toshishige; and Ohno, Kosaku, 4,106,641, Cl. 214-15.00R.

Alifano, Arthur William. Stringed musical instrument. 4,106,387, Cl. 84-312.00P.

Allais, Andre; Clemence, Francois; Deraedt, Roger; and Le Martret, Odile, to Roussel Uclaf. Quinoline-3-carboxamides. 4,107,310, Cl. 424-258.000.

Allen, William W.; Sweeney, Charles E.; Lundquist, Alvin G., Jr.; and Hersh, Raymond T., to Jensen Corporation. Spreading apparatus for sheet feeder. 4,106,227, Cl. 38-143.000.

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Bollen, Philip Stuart; and Amin, Surendra A., 4,107,251, Cl. 264-171.000.
Chlanda, Frederick P.; Nagasubramanian, Krishnamurthy; and Liu, Kang-Jen, 4,107,015, Cl. 204-180.00P.
Lewis, Donald J.; and Jankowski, Albert J., 4,107,645, Cl. 340-52.00E.

Nagasubramanian, Krishnamurthy; and Liu, Kang-Jen, 4,107,264, Cl. 423-81.000.
Phillips, Benjamin A., 4,106,309, Cl. 62-476.000.
Sukornick, Bernard; Minhas, Pritam Singh; and Sweeney, Richard Francis, 4,107,055, Cl. 252-8.600.

Allis-Chalmers Corporation: *See—*
Kemnitz, Robert H., 4,106,707, Cl. 241-202.000.
Knudson, Henry T., 4,106,269, Cl. 56-15.800.
Nelson, John P.; and Hanaway, Roger D., 4,106,649, Cl. 214-522.000.
Peterson, James F.; Freier, Edward, Jr.; and Burmesch, Gerald C., 4,106,272, Cl. 56-202.000.

Allmanna Svenska Elektriska Aktiebolaget: *See—*
Jansson, Gunnar, 4,107,245, Cl. 264-40.100.

Almen, Rune, to Sensotherm AB. Corrugated sheet metal heat transfer member. 4,107,394, Cl. 428-595.000.

Altenbokum, Karlheinz; Goldschmidt, Rolf; Hansgen, Klaus; Hiersig, Heinz M.; and Szynka, Peter, to Mannesmann Aktiengesellschaft. Planetary gear. 4,106,366, Cl. 74-801.000.

Aluminum Pechiney: *See—*
Reh, Lothar; Plass, Ludolf; and Marchessaux, Philippe, 4,107,281, Cl. 423-625.000.

Amberg, Stephen W.; and Doherty, Thomas E., to Owens-Illinois, Inc. Pick-up head assembly for use in apparatus for fabricating thermoplastic containers. 4,106,397, Cl. 93-55.10R.

American Can Company: *See—*
Badavas, Charles Arthur, 4,106,607, Cl. 192-129.00B.
Karoly, Gabriel; and Gardon, John L., 4,107,353, Cl. 427-54.000.
Wiesman, Dale Clifford, 4,107,380, Cl. 428-327.000.

American Cyanamid Company: *See—*
Conrow, Ransom Brown; and Bernstein, Seymour, 4,107,201, Cl. 260-506.000.
Conrow, Ransom Brown; and Bernstein, Seymour, 4,107,202, Cl. 260-506.000.
Floyd, Middleton Brawner, Jr.; Weiss, Martin Joseph; McGahren, William James; and Schaub, Robert Eugene, 4,107,441, Cl. 560-121.000.
Garber, Murray, 4,107,170, Cl. 260-306.70T.
Goldman, Leon; Lin, Yang-i; and Marsico, Joseph William, Jr., 4,107,326, Cl. 424-304.000.
Paul, Rolf; and Menschik, Judith, 4,107,307, Cl. 424-249.000.
Paul, Rolf; and Menschik, Judith, 4,107,308, Cl. 424-249.000.
Paul, Rolf; and Menschik, Judith, 4,107,309, Cl. 424-249.000.

American Hoechst Corporation: *See—*
Effland, Richard C.; Davis, Larry; and Schaub, Wolfgang, 4,107,074, Cl. 260-326.50B.
Effland, Richard C.; Davis, Larry; and Schaub, Wolfgang, 4,107,187, Cl. 260-326.290.
McFadden, Arthur R.; and Helsley, Grover C., 4,107,322, Cl. 424-278.000.
McFadden, Arthur Raymond; and Aultz, Daniel Eugene, 4,107,177, Cl. 260-332.20C.
McFadden, Arthur Raymond; and Aultz, Daniel Eugene, 4,107,321, Cl. 424-274.000.

American Hoist & Derrick Company: *See—*
Crook, Edward J., Jr., 4,106,284, Cl. 59-85.000.

American Hospital Supply Corporation: *See—*
Carpentier, Alain F.; and Lane, Ernest, 4,106,129, Cl. 3-1.500.
Johnson, Clifford Carl; and Eitzen, Vincent Elliott, 4,107,467, Cl. 179-2.0DP.
Jones, Eugene C., 4,106,654, Cl. 215-329.000.

American Optical Corporation: *See—*
Haney, Jerry D., 4,106,498, Cl. 128-2.05A.
McEachern, Robert A., 4,106,494, Cl. 128-2.06B.

American Safety Equipment Corporation: *See—*
Mattchen, Terry M., 4,106,181, Cl. 29-450.00R.
Ulrich, Charles J., 4,106,721, Cl. 242-107.000.

American Seating Company: *See—*
Barecki, Chester J., 4,106,810, Cl. 297-183.000.

American Standard Inc.: *See—*
Delker, Wilfried, 4,106,131, Cl. 4-1.000.

American Sterilizer Company: *See—*
Saluja, Satinder K., 4,107,769, Cl. 362-402.000.

AMF Incorporated: *See—*
Seiling, Samuel O., 4,107,341, Cl. 426-504.000.

Amin, Surendra A.: *See—*
Bollen, Philip Stuart; and Amin, Surendra A., 4,107,251, Cl. 264-171.000.

AMP Incorporated: *See—*
Asick, John Carl; and Huffnagle, Clifton Wesley, 4,106,836, Cl. 339-97.00C.
Thornton, David Charles; Lightner, Linn Stephen; and Lannan, Patrick Edward, 4,106,523, Cl. 137-614.040.
Weidler, Charles Harry, 4,107,499, Cl. 200-153.0LA.

Analog Technology Corporation: *See—*
Lawrence, James L., Jr.; Holzl, Robert A.; and Pickett, Frederick P., 4,106,744, Cl. 249-96.000.

Anchor Wire Corporation of Tennessee: *See—*
Hogg, James W., 4,106,741, Cl. 248-467.000.

Ancos Co., Ltd.: *See—*
Torii, Osamu, 4,106,874, Cl. 401-67.000.

Anders, Dietmar, to Hermann Berstorff Maschinenbau GmbH. Extruder screw. 4,107,788, Cl. 366-81.000.

Anders, Ronald J., to Rockwell International Corporation. Portable field machine for cutting, grinding and lapping valve seats. 4,106,880, Cl. 408-1.00R.

Anderson, Bruce W., to Illinois Tool Works Inc. Freezer lock assembly with key ejecting mechanism. 4,106,317, Cl. 70-388.000.

Anderson, Eric G., to Burroughs Corporation. Current control circuit. 4,107,593, Cl. 318-685.000.

Anderson, J. Edward C., to Marquette Metal Products Co. Pawl spring assembly for a rotary impact mechaniam. 4,106,572, Cl. 173-93.000.

Anderson, Thomas E.; Ibsen, Ole N.; and Walker, Loren H., to General Electric Company. Circuit for shutting down an inverter. 4,107,771, Cl. 363-58.000.

Anderson, Thomas W. Power translation machine with oscillating piston. 4,106,441, Cl. 123-18.00R.

Andersson, Josef Carl-Olof. Sleeper of steel or similar material. 4,106,696, Cl. 238-62.000.

Andoh, Shizuo: *See—*
Kawada, Toyoshi; Andoh, Shizuo; and Yoshikawa, Kazuo, 4,107,578, Cl. 315-169.0TV.

Andrianjafy, Gabriel Rostanol, to B.S.G. Designs, Inc. Apparatus for dyeing, optionally fixing and eluting a dyeable substrate. 4,106,314, Cl. 68-22.00R.

Angelichio, Gerald A.; and Digilio, Frank A., to Mohawk Data Sciences Corp. Print hammer apparatus. 4,106,406, Cl. 101-93.310.

Angell, Richard Gordon, Jr.; Gross, Laurence Herbert; and Berger, Sidney Ethan, to Union Carbide Corporation. Injection molding reduced combustibility high impact strength polyethylene articles. 4,107,258, Cl. 264-328.000.

Anheuser-Busch, Incorporated: *See—*
Tutor, Gerald L.; Fruin, James C.; and Helm, James L., 4,107,338, Cl. 426-293.000.

Ankenman, Thomas W.: *See—*
White, Allen A.; Case, Cecil L.; Ankenman, Thomas W.; and Yatcilla, George, 4,106,268, Cl. 56-1.000.

Anquetin, Jacques. Flexible lighting strip. 4,107,767, Cl. 362-236.000.

Anritsudenki Kabushikigaisha: *See—*
Takahashi, Yoshiyuki; Nagai, Akihiko; Kawawa, Shigenobu; Kubozono, Hidetaka; and Tanaka, Mitsuo, 4,106,329, Cl. 73-15.00B.

Anselrode, Lodewijk, to Stork Brabant B.V. Method of manufacturing a seamless cylindrical stencil and a small-mesh stencil obtained by applying this method. 4,107,003, Cl. 204-16.000.

Anthes Imperial Limited: *See—*
Pearson, Allen F.; Mayo, Paul A.; and Lorenz, Ronald N., 4,107,777, Cl. 364-465.000.

Aoki, Hiroyuki; Takao, Hiroshi; and Oyamada, Akira, to Nissan Motor Company, Limited. High temperature abrasion-resistant material and method of producing same. 4,107,392, Cl. 428-547.000.

Aoki, Norimichi: *See—*
Kagawa, Fumio; and Aoki, Norimichi, 4,106,915, Cl. 51-296.000.

Aotani, Seiji: *See—*
Ikeda, Hiroharu; Aotani, Seiji; and Harita, Yoshiyuki, 4,106,943, Cl. 96-115.00R.

Apelt, Heinz: *See—*
Ortmanns, Theodor; Apelt, Heinz; and Packes, Helmut, 4,106,709, Cl. 242-7.030.

Arai, Atsuaki: *See—*
Tanaka, Mitsugu; Nakazyo, Kiyoshin; and Arai, Atsuaki, 4,106,942, Cl. 96-100.00N.

Arai, Hiroshi; and Taniguchi, Koichi, to Nippondenso Co., Ltd.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Centralized warning systeni for vehicle. 4,107,646, Cl. 340-52.00F.

Arai, Hiroshi: *See—*
Nagara, Toshio; Nakagawa, Kogoro; Higo, Nobumasa; Kuno, Masanori; Arai, Hiroshi; and Ota, Jun, 4,107,493, Cl. 200-84.00C.

Arai, Toshiaki: *See—*
Tashiro, Yasuhisa; Sugimura, Hideo; Arai, Toshiaki; Suzuki, Masao; and Shirai, Tadashi, 4,107,203, Cl. 260-518.00R.

Arant, Gene W.: *See—*
Weber, Frank K., 4,107,770, Cl. 362-405.000.

Arcamone, Federico; Bernardi, Luigi; Patelli, Bianca; and Penco, Sergio, to Societa Farmaceutici Italia S.p.A. Process for preparing daunomycin and analogues thereof. 4,107,423, Cl. 536-4.000.

Arcella, Frank G., to Westinghouse Electric Corp. Heat pipe heat amplifier. 4,106,554, Cl. 165-32.000.

Archer Daniels Midland Company: *See—*
Randall, James R.; Langhurst, Arling K.; Schopmeyer, Herman H.; and Seaton, Robert L., 4,106,487, Cl. 127-23.000.

Argus Chemical Corporation: *See—*
Friedman, Ronald L., deceased; and Lewis, Roger N., 4,107,419, Cl. 526-228.000.
Minagawa, Motonobu; Nakahara, Yutaka; and Haruna, Tohru, 4,107,136, Cl. 260-45.95C.

Arizona Chemical Company: *See—*
Schluenz, Robert William; and Davis, Curry Beach, 4,107,420, Cl. 526-237.000.

Armer Construction Company: *See—*
Hufford, Jerrold L., 4,106,552, Cl. 165-2.000.

Armstrong Cork Company: *See—*
Dieck, Ronald L.; and Quinn, Edwin J., 4,107,108, Cl. 521-85.000.
Dieck, Ronald L.; Magnusson, Alan B.; and Quinn, Edwin J., 4,107,146, Cl. 528-168.000.

Arnaud, Jacques Alexis, to Bell Telephone Laboratories, Incorporated. Noncircular symmetric optical fiber waveguide having minimum modal dispersion. 4,106,847, Cl. 350-96.310.

Arndt, Walter, to Friedrich Krollmann, Firma. Wire pointing machine. 4,106,352, Cl. 74-29.000.

Arnett, Henry D.: *See—*
Vanderplaats, Norman R.; and Arnett, Henry D., 4,107,575, Cl. 315-3.500.
Arnett, Roy L. Boat bracket. 4,106,737, Cl. 248-226.400.
Arpe, Hans-Jurgen: *See—*
Schulz, Lothar; and Arpe, Hans-Jurgen, 4,107,263, Cl. 423-481.000.
Arthur W. Reed Machine Co.: *See—*
Morgan, Lewis Coleman; and Reed, Clarence Arthur, 4,107,694, Cl. 343-715.000.
Arvin Industries, Inc.: *See—*
Maxey, Alexander R., 4,107,744, Cl. 360-73.000.
Asahi-Dow Limited: *See—*
Yasuike, Akio; Kataoka, Hiroshi; Fujikawa, Tutomu; and Suzuki, Naoto, 4,106,887, Cl. 425-549.000.
Asahi Glass Company, Ltd.: *See—*
Nomaki, Koji; Saoyama, Yoshihito; and Tamamura, Ryo, 4,106,930, Cl. 75-134.00B.
Ukihashi, Hiroshi; Uchino, Tetsuya; Abe, Takeshi; and Kunii, Nobuaki, 4,107,356, Cl. 427-195.000.
Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Hosoi, Keizo; Endo, Tadayoshi; and Kanzaki, Hidetosi, 4,107,128, Cl. 260-40.00R.
Kusunose, Tetsuhiro; Shima, Tsukasa; Henmi, Hiroshi; and Yasui, Sadahiko, 4,107,374, Cl. 428-288.000.
Suzuki, Nobuyuki; Kobayashi, Yukinari; Hiyoshi, Yumiko; Takagi, Seiji; Sone, Takanori; Wakabayashi, Mikio; and Sowa, Tuneo, 4,107,162, Cl. 544-313.000.
Asai, Kiyokazu; and Takeuchi, Akihiro, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Ultrasonic wave carburetor. 4,106,459, Cl. 123-141.000.
Asakawa, Kenichi; and Yoshida, Makoto, to Nippon Steel Corporation. Method for effecting one side molten metal plating. 4,107,357, Cl. 427-300.000.
Asami, Shunichi: *See—*
Seita, Toru; Asami, Shunichi; and Shimizu, Akihiko, 4,107,097, Cl. 521-32.000.
Asano, Chihiro; Hikita, Shigeyuki; and Kato, Kunio, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Current limiting element for preventing electrical overcurrent. 4,107,640, Cl. 338-23.000.
ASEA Aktiebolag: *See—*
Soderstrom, Sven-Erik, 4,106,872, Cl. 356-4.000.
Sundberg, Yngve, 4,106,546, Cl. 164-49.000.
Ashford, Bryan. Shampoo and conditioner warmer. 4,107,513, Cl. 219-521.000.
Ashland Oil, Inc.: *See—*
MacDonald, Ira A.; and Egan, Richard R., 4,107,345, Cl. 426-637.000.
Asick, John Carl; and Huffnagle, Clifton Wesley, to AMP Incorporated. Crimp barrel for thick, flat, flexible cable. 4,106,836, Cl. 339-97.00C.
Asija, Satya Pal. Electroventriloquist. 4,107,462, Cl. 179-1.0VC.
Asokan, Sangarappillai: *See—*
Fernando, Chulani Kumarlal; Asokan, Sangarappillai; Nagendran, Sangarappillai; Wickramasinghg, Mohanlal Randith; and Weirich, H. Paul, 4,106,433, Cl. 118-212.000.
Assa, Menachem: *See—*
Pury, Thomas; Assa, Menachem; and Wagner, Howard R., 4,107,590, Cl. 318-628.000.
Associates of Cape Cod, Inc.: *See—*
Sullivan, James D., Jr.; and Watson, Stanley W., 4,107,077, Cl. 252-408.000.
Asztalos, Stefan; Stephan, Alfred; and Mayer, Reinhold, to Linde Aktiengesellschaft. Connector for duct systems for low temperature fluids. 4,106,796, Cl. 285-133.00R.
Atari, Inc.: *See—*
Crummett, James G., 4,107,642, Cl. 338-128.000.
Mayer, Steven T.; and Milner, Ronald E., 4,107,665, Cl. 340-324.0AD.
Aterianus, John S., to FMC Corporation. Wrapping machine and method with four side rotary tucker. 4,106,262, Cl. 53-28.000.
Aterianus, John S., to FMC Corporation. Wrapping machine and method with four side rotary tucker. 4,106,265, Cl. 53-180.00R.
Atlas Copco Aktiebolag: *See—*
Karden, Karl Gosta; and Berger, Karl Gustav, 4,106,750, Cl. 251-282.000.
Verner, Bo Lennart; and Fors, Lars Borje Staffan, 4,107,240, Cl. 261-77.000.
Atomic Energy of Canada Limited: *See—*
Holmes, John M., 4,107,207, Cl. 260-583.00R.
Atsukawa, Masumi; Shinoda, Naoharu; and Tanaka, Takeji, to Mitsubishi Jukogyo Kabushiki Kaisha. Wet-treatment of exhaust gases. 4,107,271, Cl. 423-235.000.
Auburn University Research Foundation: *See—*
Perkins, Warren S., 4,106,900, Cl. 8-115.600.
Auclair, Michel; and Le Parmentier, Louis, to Exxon Research & Engineering Co. Reducing pollution from internal combustion engines. 4,106,287, Cl. 60-274.000.
Audi Nsu Auto Union Aktiengesellschaft: *See—*
Klaus, Heck, 4,106,977, Cl. 156-645.000.
August Bilstein, Firma: *See—*
Hausmann, Erwin, 4,106,596, Cl. 188-314.000.
August, William S., to A-T-O Inc. Hub cap for trailer wheels and the like. 4,106,816, Cl. 301-108.00R.
Augustine, Harry G.; Krupinski, Kenneth C.; and Smith, Frank A., to United States Steel Corporation. Coated pitch prill. 4,107,382, Cl. 428-368.000.
Aultz, Daniel Eugene: *See—*
McFadden, Arthur Raymond; and Aultz, Daniel Eugene, 4,107,177, Cl. 260-332.20C.
McFadden, Arthur Raymond; and Aultz, Daniel Eugene, 4,107,321, Cl. 424-274.000.
Auphan, Michel Joseph, to U.S. Philips Corporation. Device for examination by means of ultrasonic vibrations. 4,106,348, Cl. 73-624.000.
Austin, Harry W.: *See—*
Marangoni, Roy D.; and Austin, Harry W., 4,106,127, Cl. 2-416.000.
Autoclave Engineers, Inc.: *See—*
Ruyak, Robert F., 4,106,825, Cl. 308-139.000.
Automation Industries, Inc.: *See—*
Cooper, Earl A., 4,106,839, Cl. 339-143.00R.
Kutnyak, Thomas A.; Dunn, George T.; and Guiles, Chester L., 4,106,968, Cl. 156-189.000.
Automobiles Peugeot: *See—*
Bouvet, Jean-Marie, 4,106,367, Cl. 74-866.000.
Avon Rubber Company Limited: *See—*
Gardner, Eric Richard, 4,107,369, Cl. 428-246.000.
Awao, Takeyoshi: *See—*
Komura, Ichiro; Awao, Takeyoshi; and Yamada, Kazuhiko, 4,106,989, Cl. 195-62.000.
Axelrod, Herbert R. Method of binding papers. 4,106,148, Cl. 11-1.0AD.
Aylott, Eric Victor. Artificial fingernail display package. 4,106,614, Cl. 206-45.140.
B. F. Goodrich Company, The: *See—*
Riew, Changkiu Keith; Siebert, Alan R.; and Rowe, Eugene H., 4,107,116, Cl. 260-23.0EP.
B.S.G. Designs, Inc.: *See—*
Andrianjafy, Gabriel Rostanol, 4,106,314, Cl. 68-22.00R.
Baba, Masanao, to Nippon Cable System Inc. Control unit for throttle and clutches. 4,106,604, Cl. 192-0.098.
Babcock & Wilcox Company, The: *See—*
Fulmer, John Arthur; and Walker, David Judson, 4,106,890, Cl. 431-184.000.
Babiol, Pierre, to Societe Nouvelle de Bouchons Plastiques, S.N.B.P. Composite stopper. 4,106,656, Cl. 215-364.000.
Babish, Richard Constantine, to Perkin-Elmer Corporation, The. Stray light control in an optical system. 4,106,856, Cl. 350-199.000.
Bache, William Harry, to Steel Stampings Limited. Vehicle wheels. 4,106,172, Cl. 29-159.010.
Backus, James H.: *See—*
McDowell, Robert, 4,107,789, Cl. 366-3.000.
Bacskai, Robert, to Chevron Research Company. Anionic copolymerization of 2-pyrrolidone with C_7-C_{12} lactam. 4,107,154, Cl. 528-312.000.
Baculo, Umberto A. Adjustable form clamp. 4,106,746, Cl. 249-216.000.
Badavas, Charles Arthur, to American Can Company. Pneumatic safety system for machine enclosures. 4,106,607, Cl. 192-129.00B.
Baer, John Stephen. Wind chill meter and method of measuring wind chill effect. 4,106,339, Cl. 73-339.00C.
Baier, John F. Heating system with reserve thermal storage capacity. 4,106,692, Cl. 237-8.00R.
Bailey, August V.; Boudreaux, Gordon J.; Sumrell, Gene; and Novak, Arthur F., to United States of America, Agriculture. New antimicrobial esters of aliphatic diols. 4,107,192, Cl. 260-410.500.
Bailey, Denis M., to Sterling Drug Inc. α,α-Bis-[4-(R-amino)-1-pyridinium]xylenes and antibacterial and antifungal uses. 4,107,313, Cl. 424-263.000.
Bailey, Edward A., to Joy Manufacturing Company. Drill. 4,106,573, Cl. 173-106.000.
Bainard, Dean R.: *See—*
Benjamin, Martin E.; and Bainard, Dean R., 4,106,781, Cl. 277-82.000.
Baker, Fred E., to General Electric Company. Emergency power failure light. 4,107,766, Cl. 362-226.000.
Baker, Thomas E. Swimming pool skimmer and the like. 4,106,157, Cl. 16-112.000.
Baklien, Asbjorn; Serban, Alexandru; and Gregory, Jocelyn Margaret, to ICI Australia Limited. Pesticidal compositions. 4,106,924, Cl. 71-106.000.
Ball, Harry: *See—*
Henlis, Lawrence Philip, 4,106,454, Cl. 123-122.00F.
Baltimore Brushes, Inc.: *See—*
Vines, Ellsworth, 4,106,434, Cl. 118-258.000.
Baltz, John; and Coltrinari, Enzo, to PGP Industries Inc. Process for the separation of platinum group metals. 4,107,261, Cl. 423-22.000.
Ban, Itsuki; and Shiraki, Manabu. Three-phase DC motor having non-superimposed armature coils. 4,107,587, Cl. 318-439.000.
Ban, Itsuki; Nozaki, Sumio; Kasuya, Takanori; Shinkado, Yukio; and Yano, Kanji. Track change-over mechanism for a multi-channel tape recorder. 4,107,750, Cl. 360-106.000.
Bancroft, Joseph C.; and Hallin, Peter R., to Croft Metals, Inc. Lockable window construction. 4,106,239, Cl. 49-449.000.
Bannon, Harry B.: *See—*
Moon, William T., Jr.; Rogers, Arden D.; Goff, Clifford E.; and Bannon, Harry B., 4,107,492, Cl. 200-81.90M.
Bansemir, Klaus: *See—*
Wegner, Jurgen; Bansemir, Klaus; and Ettingshausen, Othmar V., 4,107,312, Cl. 424-263.000.
Barber-Colman Company: *See—*
Jornod, Eugene R., 4,107,700, Cl. 346-76.00R.
Barber, Everett M., Jr., to Sunworks, Inc. Solar energy collector. 4,106,483, Cl. 126-271.000.

Barden, Walter M., Jr.: *See—*
Brower, Loyd R., Jr.; Madsen, Leonard P.; Zutaut, Chesly L.; and Barden, Walter M., Jr., 4,107,016, Cl. 204-181.00R.

Barecki, Chester J., to American Seating Company. Grab rail for transit vehicle seats. 4,106,810, Cl. 297-183.000.

Bariana, Dilbagh S.: *See—*
Biel, John Hans; Bariana, Dilbagh S.; and Fung, Anthony K. L., 4,107,172, Cl. 260-308.00D.

Barigot, Jean-Claude: *See—*
Gauriat, Gilles; Vernezy, Jacques; and Barigot, Jean-Claude, 4,107,468, Cl. 179-15.0BY.

Barmag Barmer Maschinenfabrik Aktiengesellschaft: *See—*
Schippers, Heinz; Lenk, Erich; Mayer, Manfred; Busch, Hans-Jochen; and Bremer, Hermann, 4,106,710, Cl. 242-18.00R.

Barmeier, Harold J., Jr.; and Wright, David A., to National Marine Service, Inc. Self-adjusting exciter band for shaft speed magnetic pickup. 4,107,601, Cl. 324-173.000.

Barnes, Clive: *See—*
Ward, John Joseph Bernard; and Barnes, Clive, 4,107,004, Cl. 204-51.000.

Barnes, Michael L.; and Whitescarver, Olin D., to Union Oil Company of California. Wellhead apparatus. 4,106,562, Cl. 166-97.000.

Barracudaverken AB: *See—*
Larsson, Erik Johan, 4,106,149, Cl. 14-27.000.

Barrett, David M.: *See—*
Garratt, Philip Melvin; Foley, Leroy Earl; Godbarsen, Robert; and Barrett, David M., 4,107,531, Cl. 250-360.000.

Barrett, Johnny M.; and Hamilton, Stephen P., to Texas Instruments Incorporated. Electronic calculator or microprocessor with indirect addressing. 4,107,781, Cl. 364-700.000.

Bartlett, Lawrence C., to Eastman Kodak Company. Apparatus for multiple stripe coating. 4,106,437, Cl. 118-412.000.

Barton, Paul, to International Standard Electric Corporation. Scanning beam receiver system with coherent post-detection signal processing. 4,107,686, Cl. 343-106.00R.

Bartsch, Ulrich: *See—*
Salje, Ernst; and Bartsch, Ulrich, 4,106,382, Cl. 83-835.000.

BASF Aktiengesellschaft: *See—*
Wurmb, Rolf; Seydl, Wolfgang; Penzien, Klaus; Gausepohl, Hermann; and Sterzel, Hans-Josef, 4,107,231, Cl. 260-873.000.

BASF Wyandotte Corporation: *See—*
Peterhans, Josef; Volkert, Otto; and Beckerle, Wilhelm Friedrich, 4,107,100, Cl. 521-137.000.

Basiulis, Algerd, to Hughes Aircraft Company. Method for closure of heat pipes and device fabricated thereby. 4,106,171, Cl. 29-157.30R.

Bassinger, Grey. Borehole contacting apparatus for bottom hole assembly. 4,106,823, Cl. 308-4.00A.

Batova, Galina Alexandrovna: *See—*
Kucherenko, Vladimir Ilich; Flerov, Valery Nikolaevich; Korolev, Georgy Vladimirovich; Kotov, Evgeny Pavlovich; Praporov, Anatoly Mikhailovich; Batova, Galina Alexandrovna; Melikova, Gayane Leonovna; and Kolomeichuk, Alexandr Ivanovich, 4,107,011, Cl. 204-151.000.

Batreau, Francois: *See—*
Cavalieri, Michel; and Batreau, Francois, 4,106,753, Cl. 254-157.000.

Battelle Development Corporation: *See—*
Khera, Surjit Singh, 4,107,091, Cl. 252-466.00J.

Battelle Memorial Institute: *See—*
Rohrmann, Charles A., 4,107,280, Cl. 423-502.000.

Batterton, Elmo L.; and Lonsdale, Melvin J., to Meyer Morton Co. Grain dryer sidewall construction and method of drying grain. 4,106,212, Cl. 34-65.000.

Bauer, Donald J.; and Eisele, Judith A., to United States of America, Interior. Production of pure alumina from iron contaminated sulfate liquors. 4,107,266, Cl. 423-112.000.

Baum, Art: *See—*
Jerome, Robert J.; and Baum, Art, 4,106,561, Cl. 166-55.200.

Baumann, Helmut; and Petzi, Fritz, to Ludwig Riedhammer GmbH & Co. K.G. Sintering furnace. 4,106,893, Cl. 432-77.000.

Baumann, Marcus; Kvita, Vratislav; Roth, Martin; and Waterhouse, John Sidney, to Ciba-Geigy Corporation. Imidyl compounds. 4,107,174, Cl. 260-326.0NS.

Bayard, Michel Lucien, to Texas Instruments Incorporated. Electrochromic display cell. 4,106,862, Cl. 350-357.000.

Bayer Aktiengesellschaft: *See—*
Bier, Peter; Binsack, Rudolph; and Vernaleken, Hugo, 4,107,149, Cl. 528-309.000.
Dahm, Manfred; and Jautelat, Manfred, 4,107,102, Cl. 521-163.000.
Fuhr, Karl; Traenckner, Hans-Joachim; Rosenkranz, Hans Jurgen; Rufolph, Hans; Patheiger, Manfred; and Haus, Artur, 4,107,012, Cl. 204-159.190.
Grotkopp, Detlef; Wedemeyer, Karlfried; Behrenz, Wolfgang; and Hammann, Ingeborg, 4,107,324, Cl. 424-300.000.
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Hammann, Ingeborg; and Behrenz, Wolfgang, 4,107,301, Cl. 424-200.000.
Hubner, Hans; Blahak, Johannes; and Meiners, Hans-Joachim, 4,107,103, Cl. 528-72.000.
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Konig, Eberhard; and Pedain, Josef, 4,107,200, Cl. 260-465.00E.
Kubens, Rolf, 4,107,101, Cl. 521-137.000.
Langheinrich, Klaus; Berenstecher, Otto; and Renziehausen, Horst, 4,106,903, Cl. 8-196.000.
Petruck, Gerd-Michael; Klauke, Erich; and Jager, Horst, 4,107,186, Cl. 260-351.000.
Schrock, Wilfried; Konig, Hans-Bodo; Preiss, Michael; Metzger, Karl Georg; and Walkowiak, Michael, 4,107,304, Cl. 424-246.000.
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Traubel, Harro; Reiff, Helmut; and Dieterich, Dieter, 4,106,898, Cl. 8-94.330.

Bayer, Friedrich, to Quick-Rotan Becker & Notz KG. Automatically operating speed-regulated positioning arrangement. 4,107,592, Cl. 318-568.000.

Bayles, Francis Derrick; and Dudley, Michael Alan, to Canada Wire and Cable Limited. Method for producing a mica based insulation. 4,107,358, Cl. 427-379.000.

Bayless, Robert G., to Capsulated Systems, Inc. Method of producing microcapsules and resulting product. 4,107,071, Cl. 252-316.000.

Bazhakov, Daniel Kalimullovich: *See—*
Fasman, Anatoly Borisovich; Sokolsky, Dmitry Vladimirovich; Rutman, Grigory Iosifovich; Michurov, Jury Ivanovich; Zavorin, Viktor Anatolievich; Shalimova, Zoya Stepanovna; Timofeeva, Venera Fatykhovna; Dautov, Tulkibai Galikbarovich; Bazhakov, Daniel Kalimullovich; and Sivakov, Jury Mikhailovich, 4,107,090, Cl. 252-465.000.

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Doriguzzi, Rino; Egloff, Markus; Kaufmann, Meinolph; Nehring, Jurgen; and Scheffer, Terry J., 4,106,859, Cl. 350-338.000.
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Beale, Julian R. A., to U.S. Philips Corporation. Vehicle power transmission arrangements and electronic power controls. 4,107,776, Cl. 364-431.000.

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Becker, Frederick R., III; and Nicely, Charles W., to Metropolitan Wire Corporation. Article supporting apparatus. 4,106,736, Cl. 248-222.200.

Beckerle, Wilhelm Friedrich: *See—*
Peterhans, Josef; Volkert, Otto; and Beckerle, Wilhelm Friedrich, 4,107,100, Cl. 521-137.000.

Beckman Instruments, Inc.: *See—*
Sharples, Thomas Davy, 4,106,671, Cl. 222-61.000.

Becraft, William A.: *See—*
Luke, Perry J.; Machamer, James L.; and Becraft, William A., 4,107,650, Cl. 340-146.1AL.

Becton, Dickinson and Company: *See—*
Percarpio, Edward P., 4,106,497, Cl. 128-2.00F.

Beebe, William F.: *See—*
Neff, Charles G., 4,106,793, Cl. 280-435.000.

Beecham Group Limited: *See—*
Bentley, Peter Hubert; and Clayton, John Peter, 4,107,433, Cl. 544-30.000.
Watts, Eric Alfred, 4,107,317, Cl. 424-267.000.

Beeston Company Limited: *See—*
Horvath, Stephen, 4,107,008, Cl. 204-129.000.

Behle, Gunter R., to ACF Industries, Incorporated. Bottom operable air inlet and outlet valve assembly. 4,106,749, Cl. 251-144.000.

Behrenz, Wolfgang: *See—*
Grotkopp, Detlef; Wedemeyer, Karlfried; Behrenz, Wolfgang; and Hammann, Ingeborg, 4,107,324, Cl. 424-300.000.
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Behringwerke Aktiengesellschaft: *See—*
Karges, Hermann Erich; and Heimburger, Norbert, 4,106,990, Cl. 195-63.000.

Bell & Howell Company: *See—*
Stefansson, Rafn, 4,106,766, Cl. 271-181.000.

Bell Telephone Laboratories, Incorporated: *See—*
Arnaud, Jacques Alexis, 4,106,847, Cl. 350-96.310.
DiLorenzo, James Vincent; Niehaus, William Charles; and Varnerin, Lawrence John, Jr., 4,106,959, Cl. 148-175.000.
Frank, Amalie Julianna, 4,107,648, Cl. 340-146.30H.
Hawley, George Thomas; and Young, Lawrence Henry, 4,107,495, Cl. 179-84.00T.
Henry, Paul Shala, 4,107,668, Cl. 340-347.0AD.
Marcatili, Enrique Alfredo Jose, 4,106,850, Cl. 350-96.310.
Miller, Gabriel Lorimer, 4,107,721, Cl. 357-30.000.
Runge, Peter Klaus, 4,107,242, Cl. 264-1.000.
Schneider, Herbert Anton, 4,107,474, Cl. 179-18.0GF.
Tewksbury, Stuart Keene, 4,107,669, Cl. 340-347.0AD.

Bellina, Russell Frank; and Fost, Dennis Lynn, to Du Pont de Nemours, E. I., and Company. Miticidal and aphicidal method utilizing 2-higher alkyl-3-hydroxy-1,4-naphthoquinone carboxylic acid esters. 4,107,325, Cl. 424-301.000.

Beloit Corporation: *See—*
Cormack, Alexander D.; and Kool, Boris, 4,106,778, Cl. 277-9.500.
Phillips, Irvin J., 4,106,429, Cl. 118-63.000.
Sokolow, Nickolas N., 4,106,886, Cl. 425-526.000.

Belokin, Paul, Jr. Display fixture. 4,106,828, Cl. 312-107.000.

Belson, Gary W. Tactical load bearing vest. 4,106,121, Cl. 2-102.000.

Belt, Kenneth W.: *See—*
Queen, Daniel L.; and Belt, Kenneth W., 4,107,613, Cl. 325-348.000.

Bement, Laurence J., to United States of America, National Aeronau-

tics and Space Administration. Totally confined explosive welding. 4,106,687, Cl. 228-2.500.
Benasutti, John Eugene, to GTE Sylvania Incorporated. Electrical contact and connector. 4,106,842, Cl. 339-221.00R.
Bendix Autolite Corporation: *See—*
Bode, James Daniel; and Rhee, Seong Kwan, 4,107,018, Cl. 204-195.00S.
Bendix Corporation, The: *See—*
Euler, Richard W., 4,106,311, Cl. 64-23.000.
Benjamin, James A.: *See—*
Pucel, Robert A.; and Benjamin, James A., 4,107,720, Cl. 357-22.000.
Benjamin, Martin E.; and Bainard, Dean R., to Garlock Inc. Unitized, grease-purgeable seal. 4,106,781, Cl. 277-82.000.
Bennett, Cleatus W., to Raymond Lee Organization, Inc., The, a part interest. Antenna mounting device. 4,107,693, Cl. 343-715.000.
Benseler, Hans, to PUMA-Sportschunfabriken Rudolf Dassler KG. Ski boot. 4,106,223, Cl. 36-117.000.
Bentley, Peter Hubert; and Clayton, John Peter, to Beecham Group Limited. Phthalidyl ester of 3-carbomoyloxy cephalosporin derivatives. 4,107,433, Cl. 544-30.000.
Bercovici, Serge, to Societe de vente de l'Aluminium Pechiney. Method of treating metal alloys to work them in the state of a liquid phase-solid phase mixture which retains its solid form. 4,106,956, Cl. 148-11.50A.
Berenstecher, Otto: *See—*
Langheinrich, Klaus; Berenstecher, Otto; and Renziehausen, Horst, 4,106,903, Cl. 8-196.000.
Berezin, Gilbert Harvey: *See—*
Aldrich, Paul Edward; and Berezin, Gilbert Harvey, 4,107,303, Cl. 424-244.000.
Berg, Jack V., to Minnesota Mining and Manufacturing Company. Hand tool for cutting and forming aesthetic ends on decorative molding. 4,106,195, Cl. 30-293.000.
Berg, Joseph E.; and Brown, Randolph E., Jr. Method for depositing film on a substrate. 4,107,350, Cl. 427-38.000.
Berger, Karl Gustav: *See—*
Karden, Karl Gosta; and Berger, Karl Gustav, 4,106,750, Cl. 251-282.000.
Berger, Sidney Ethan: *See—*
Angell, Richard Gordon, Jr.; Gross, Laurence Herbert; and Berger, Sidney Ethan, 4,107,258, Cl. 264-328.000.
Berger, Walter S.; Erhart, Andrew Paul; Fee, William O.; Holtgren, Darwin Lester; and Burd & Fletcher Company. Mating blanks. 4,106,688, Cl. 229-39.00R.
Berges, David A., to SmithKline Corporation. 3-Sulfomethyl-1,2,4-triazole-5-thiol and its alkali metal salts. 4,107,173, Cl. 260-308.00R.
Bergman, Burton; and Herman, Stewart M., to Boeing Company, The; and Aeritalia S.p.A. Escape slide deploying apparatus for use in an airplane. 4,106,729, Cl. 244-137.00P.
Berkenblit, Melvin; Chan, See Ark; Reisman, Arnold; and Zirinsky, Stanley, to International Business Machines Corporation. Process for etching holes. 4,106,975, Cl. 156-628.000.
Berlin, Richard Barnard. Clamp device. 4,106,508, Cl. 128-346.000.
Bernardi, Herbert: *See—*
Schirrmeister, Harry; von Aschwege, Gerd; Helmrich, Harald; and Bernardi, Herbert, 4,106,767, Cl. 271-188.000.
Bernardi, Luigi: *See—*
Arcamone, Federico; Bernardi, Luigi; Patelli, Bianca; and Penco, Sergio, 4,107,423, Cl. 536-4.000.
Bernhardt, Walter; and Ziegler, Bodo, to Robert Bosch GmbH. OFF-ON-START switching system for diesel engines, and particularly automotive-type diesel engines. 4,106,465, Cl. 123-179.00H.
Bernier, Donald R., to Compunetics, Incorporated. Hall effect displacement transducer using a bar magnet parallel to the plane of the Hall device. 4,107,604, Cl. 324-208.000.
Bernstein, Seymour: *See—*
Conrow, Ransom Brown; and Bernstein, Seymour, 4,107,201, Cl. 260-506.000.
Conrow, Ransom Brown; and Bernstein, Seymour, 4,107,202, Cl. 260-506.000.
Bernt, Joachim: *See—*
Wenzel, Werner; Gudenau, Heinrich; and Bernt, Joachim, 4,106,996, Cl. 201-6.000.
Berryhill, Richard J.: *See—*
Wolfe, Denis G.; and Berryhill, Richard J., 4,106,359, Cl. 74-424.80R.
Berthoux, Jean: *See—*
Chevallier, Yvonick; Martinaud, Jacques-Pierre; Meiller, Francois; and Berthoux, Jean, 4,107,079, Cl. 252-429.00R.
Bertin & Cie: *See—*
Bobleter, Andre Henri-Robert; and Simonnet, Jacques Louis-Paul, 4,106,894, Cl. 432-122.000.
Best, Robert H.; and Harris, William D., to Burlington Industries, Inc. Method and system for maintaining an electrically neutral atmosphere. 4,107,756, Cl. 361-231.000.
Beston, George H.; and Kirk, Donald W., to General Foods Limited. Method of producing dehydrated rice flakes. 4,107,344, Cl. 426-625.000.
Bethe, Elmar: *See—*
Eck, Herbert; Bethe, Elmar; Schwarzbauer, Hans; Spes, Hellmuth; and Kaiser, Klaus, 4,107,002, Cl. 203-75.000.
Bethlehem Steel Corporation: *See—*
Kostecky, James F., 4,106,738, Cl. 248-235.000.
Better Environmental Development Corporation: *See—*
Snitzer, Elias, 4,106,857, Cl. 350-311.000.
Beveridge, John H. Reciprocating piston machine with complete combustion system. 4,106,445, Cl. 123-53.00A.
Beyer, Leaman Rex. Percussion drill bit. 4,106,578, Cl. 175-407.000.
Bicek, John J., to United States of America, Energy. Optical control system for high-voltage terminals. 4,107,519, Cl. 250-199.000.
Biel, John Hans; Bariana, Dilbagh S.; and Fung, Anthony K. L., to Abbott Laboratories. Uricosuric diuretic composition. 4,107,172, Cl. 260-308.00D.
Bier, Peter; Binsack, Rudolph; and Vernaleken, Hugo, to Bayer Aktiengesellschaft. Poly(ethylene/alkylene) terephthalates which crystallize rapidly. 4,107,149, Cl. 528-309.000.
Bierlich, Johannes Harald. Window assemblies. 4,106,237, Cl. 49-249.000.
Binsack, Rudolph: *See—*
Bier, Peter; Binsack, Rudolph; and Vernaleken, Hugo, 4,107,149, Cl. 528-309.000.
Bio Research Center Company, Ltd.: *See—*
Suzuki, Shuzo; Furuhashi, Keizo; and Taoka, Akira, 4,106,986, Cl. 195-28.00R.
Biondetti, Mario; and Marchioro, Ignazio, to Escher Wyss Limited. Controlled deflection roll. 4,106,405, Cl. 100-162.00B.
Birman, Paul; and Nercessian, Sarkis, to Forbro Design Corp. Regulated power supply with auto-transformer output and direct current feedback. 4,107,620, Cl. 330-265.000.
Biro Fils: *See—*
Dion-Biro, Guy, 4,106,566, Cl. 169-44.000.
Biscosa Societe de Recherche: *See—*
Courier de Mere, Henri, 4,107,625, Cl. 331-37.000.
Bishop, Bruce J.; and Moon, Allen J., to Star Chemical, Inc. Emulsifier-solvent scour composition and method of treating textiles therewith. 4,106,901, Cl. 8-139.000.
Bisping, Hans Jurgen, to Medtronic, Inc. Transvenously implantable lead. 4,106,512, Cl. 128-418.000.
Blachford, John, to H. L. Blachford Limited. Lubricants for powdered metals, and powdered metal compositions containing said lubricants. 4,106,932, Cl. 75-252.000.
Black, Arthur L., to Ingersoll-Rand Company. Seal carrier for rotary piston engine. 4,106,780, Cl. 277-81.00P.
Black Clawson Company, The: *See—*
Seifert, Peter; and Zimmerman, Walter R., 4,106,980, Cl. 162-330.000.
Blackstone, Christopher Edward James; and Williams, Geoffrey Hugh. Articulated member for handling and controlling loads. 4,106,650, Cl. 214-750.000.
Blackstone, James Otto, Jr.; and Strother, Fred Pickett, to WestPoint Pepperell, Inc. Control apparatus for textile dyeing and tufting machinery. 4,106,416, Cl. 112-79.00A.
Blackstone Manufacturing Co., Inc.: *See—*
Weiler, Raywood C., 4,106,790, Cl. 280-166.000.
Blackwell, Henry Wayne, to Dresser Industries, Inc. Method of manufacturing an oilwell swab cup. 4,106,182, Cl. 29-460.000.
Blahak, Johannes: *See—*
Hubner, Hans; Blahak, Johannes; and Meiners, Hans-Joachim, 4,107,103, Cl. 528-72.000.
Hubner, Hans; Blahak, Johannes; and Meiners, Hans-Joachim, 4,107,152, Cl. 528-68.000.
Bleckmann, Richard. Method of cold-joining metal parts. 4,106,179, Cl. 29-432.000.
Bliss, John H. Method and apparatus to overcome aircraft control problems due to wind shear. 4,106,731, Cl. 244-188.000.
Bloomfield, Jordan J.: *See—*
Owsley, Dennis C.; and Bloomfield, Jordan J., 4,107,220, Cl. 260-646.000.
Blount, David H. Production of the reaction products of oxidated silicon compounds reacting with organic monohydroxy compounds. 4,107,140, Cl. 521-154.000.
Bluhm, Marita: *See—*
Merchant, Suresh; Winkler, Diethard; and Bluhm, Marita, 4,107,355, Cl. 427-120.000.
Bobleter, Andre Henri-Robert; and Simonnet, Jacques Louis-Paul, to Bertin & Cie; and Affimet, FRX. Apparatus for heat treating fragmented materials. 4,106,894, Cl. 432-122.000.
Bode, James Daniel; and Rhee, Seong Kwan, to Bendix Autolite Corporation. Solid electrolyte gas sensor having a protective bonding layer. 4,107,018, Cl. 204-195.00S.
Bodine Co., Inc.: *See—*
Bodine, Richard Hill, Jr.; and Rosiak, Marion, 4,107,579, Cl. 315-205.000.
Bodine, Richard Hill, Jr.; and Rosiak, Marion, to Litton Systems, Inc.; and Bodine Co., Inc., part interest to each. Starting and operating ballast for high pressure sodium lamp. 4,107,579, Cl. 315-205.000.
Boe, Norman W., to Monsanto Company. Sheer stretch hose having high compressive force uniformity, and yarn. 4,106,313, Cl. 66-202.000.
Boehm, Edward A. Positioning system utilizing binary code. 4,106,216, Cl. 35-9.00R.
Boehringer Mannheim GmbH: *See—*
Kaiser, Fritz; Schaumann, Wolfgang; Stach, Kurt, deceased; Plattner, Werner, administrator; and Voightlander, Wolfgang, 4,107,299, Cl. 424-182.000.
Boeing Company, The: *See—*
Bergman, Burton; and Herman, Stewart M., 4,106,729, Cl. 244-137.00P.
Spitzer, Robert E.; and May, Fred W., III, 4,106,730, Cl. 244-183.000.

Bohner, Beat: *See*—
Rohr, Otto; Pissiotas, Georg; and Bohner, Beat, 4,106,925, Cl. 71-108.000.

Bohnert, Darrell F. Hoe drill carrier. 4,106,788, Cl. 280-43.230.

Bollag, Werner; Ruegg, Rudolf; and Ryser, Gottlieb, to Hoffmann-La Roche Inc. Novel compounds of 9-phenyl-3,7-dimethyl-2,4,6,8-nonatetraenamide. 4,107,190, Cl. 260-404.000.

Bollen, Philip Stuart; and Amin, Surendra A., to Allied Chemical Corporation. Production of films and sheets of polyester-polycarbonate blends. 4,107,251, Cl. 264-171.000.

Boller, George Earl: *See*—
Renk, Richard John; and Boller, George Earl, 4,106,664, Cl. 220-329.000.

Bomben, John L.: *See*—
Robertson, George H.; Lazar, Melvin E.; Krochta, John M.; Farkas, Daniel F.; and Bomben, John L., 4,107,340, Cl. 426-481.000.

Bondar, Petr Grigorievich; Goroshko, Oleg Nikolaevich; Suschaya, Larisa Emmanuilovna; Lavrova, Valentina Vasilievna; Leleka, Valentina Emmanuilovna; and Ilko, Eduard Grigorievich. Catalyst for the synthesis of methanol and method for preparing same. 4,107,089, Cl. 252-465.000.

Bonello, Alfred, to Indal Product Limited. Interchangeable storm doors. 4,106,238, Cl. 49-382.000.

Bonis, Maurice: *See*—
de Brebisson, Michel; and Bonis, Maurice, 4,106,954, Cl. 148-1.500.

Bonnemay, Maurice: *See*—
Percheron born Guegen, Annick; Achard, Jean Claude; Loriers, Jean; Bonnemay, Maurice; Bronoel, Guy; Sarradin, Joel; and Schlapbach, Louis, 4,107,405, Cl. 429-218.000.

Book, David L. High atomic weight isotope separator. 4,107,524, Cl. 250-282.000.

Booker, Leslie L. Apparatus for dispensing a coating of liquid on an elevated cable or the like. 4,106,436, Cl. 118-307.000.

Boone, Philip. Device for positioning a container of supplemental material in operational alignment adjacent to a toilet-tissue holder. 4,106,616, Cl. 206-233.000.

Boone, Philip. Bathroom fixture. 4,106,617, Cl. 206-233.000.

Boonstra, Alexander Hendrik; and Mutsaers, Cornelis Adrianus H. A., to U.S. Philips Corporation. Resistance material. 4,107,387, Cl. 428-426.000.

Borcher, Charles A.; and Porter, William R., to Martin Marietta Corporation. Layered fragmentation device. 4,106,410, Cl. 102-67.000.

Borcher, Charles A.; Porter, William R.; and Harris, Martin H., to Martin Marietta Corporation. Incendiary fragmentation warhead. 4,106,411, Cl. 102-67.000.

Borg, Lars Uno; Kamp, Lars Ragnar; and Olsson, Kjell Olow Ingemar, to U.S. Philips Corporation. Safety and test device in a railway signalling system. 4,107,253, Cl. 246-182.00B.

Borg-Warner Corporation: *See*—
Ivey, John Saxon, 4,106,368, Cl. 74-866.000.
Studtmann, George Henry, 4,106,334, Cl. 73-136.00A.

Borg-Warner-Stieber GmbH: *See*—
Dieckermann, Friedhelm, 4,106,602, Cl. 192-45.000.

Borisov, Jury Tikhonovich: *See*—
Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pirogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Borisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; Shevtsov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich; Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mateshin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich; Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich; Koen, David Matveevich; Seleverstov, Vladimir Vasilievich; Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pizogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Bozisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zakharovich, 4,107,449, Cl. 13-35.000.

Boroshok, Melvin J.: *See*—
Morse, Lewis D.; Boroshok, Melvin J.; and Grabner, Roy W., 4,107,072, Cl. 252-316.000.

Bose, Amar G., to Bose Corporation. Environment for demonstrating a stereo loudspeaker system. 4,107,461, Cl. 179-1.0GA.

Bose Corporation: *See*—
Bose, Amar G., 4,107,461, Cl. 179-1.0GA.

Bossi, Oscar G., to Societe dite: Stabilimento Industriale Costruzione Macchinario Attrezzature. Device for automatically loading a machine tool, particularly a shaving machine. 4,106,632, Cl. 214-1.0BB.

Boswell, Donald D., to Hughes Aircraft Company. Method and apparatus for increasing contrast ratio of the stored image in a storage mode light valve. 4,106,853, Cl. 350-333.000.

Bott, John A. Vehicle article carrier. 4,106,680, Cl. 224-29.00R.

Bott, John A. Spare tire extraction device. 4,106,681, Cl. 224-42.120.

Boucher, Robert J.; and Brackney, Robert L., Jr., to Hughes Aircraft Company. System for overcoming the effect of electronic countermeasures. 4,107,682, Cl. 343-16.00M.

Boudreaux, Gordon J.: *See*—
Bailey, August V.; Boudreaux, Gordon J.; Sumrell, Gene; and Novak, Arthur F., 4,107,192, Cl. 260-410.500.

Boulter, David Gordon: *See*—
Britt, Ronald Howard; De Bruin, Jan; and Boulter, David Gordon, 4,106,765, Cl. 271-93.000.

Bourguignon, Guy Clement; and Maquet, Joseph Andre, to S.A. dite "Manufacture Francaise de Carrelages". Method and apparatus for manufacturing lining plates and products thereof. 4,107,378, Cl. 428-323.000.

Bousquet, Donald G.; Camp, Jesse G., Jr.; Hopkins, Mortimer Gilbert; and Jagt, Leonard J., to Gaston County Dyeing Machine Company. Textile goods bleaching means and method. 4,106,899, Cl. 8-101.000.

Boussois Souchon Neuvesel Gervais Danone (Societe Anonyme): *See*—
Corman, Guy, 4,107,523, Cl. 250-223.00B.

Bouvet, Jean-Marie, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Pressure control apparatus for the automatic transmission of automotive vehicles. 4,106,367, Cl. 74-866.000.

Boyett, Vernon Hugo; and Devine, Robert W. Point to point self-leveling plumbing device. 4,106,207, Cl. 33-286.000.

Boyle, Patrick T., to Maryland Cup Corporation. Splash proof drink-through beverage container lid. 4,106,660, Cl. 220-90.400.

Bozisov, Jury Tikhonovich: *See*—
Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pirogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Borisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; Shevtsov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich; Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mateshin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich; Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich; Koen, David Matveevich; Seleverstov, Vladimir Vasilievich; Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pizogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Bozisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zakharovich, 4,107,449, Cl. 13-35.000.

Brachert, Heinrich; and Eich, Johannes, to Dynamit Nobel Aktiengesellschaft. Temperature-compensating propellant charge. 4,106,960, Cl. 149-11.000.

Brackenridge, David R.: *See*—
Dubeck, Michael; and Brackenridge, David R., 4,107,104, Cl. 521-171.000.

Brackney, Robert L., Jr.: *See*—
Boucher, Robert J.; and Brackney, Robert L., Jr., 4,107,682, Cl. 343-16.00M.

Braddick, Britt O., to Texas Iron Works, Inc. Seal nipple packer. 4,106,565, Cl. 166-118.000.

Brandenburg, Frank J., Jr. Insulated radiant heater. 4,107,512, Cl. 219-343.000.

Brandon, Richard N. Platter. 4,106,658, Cl. 220-453.000.

Bratton, Francis H., deceased: *See*—
Liu, William Chang; Bratton, Francis H., deceased; and Nali, Robert Ronald, 4,107,259, Cl. 264-331.000.

Bratton, Jean C., executrix: *See*—
Liu, William Chang; Bratton, Francis H., deceased; and Nali, Robert Ronald, 4,107,259, Cl. 264-331.000.

Braun, Roland, to Raschig G.m.b.H. Contacting arrangement for mass transfer operations. 4,107,241, Cl. 261-79.00A.

Brautigam, Rolf: *See*—
Haas, Lothar; Brautigam, Rolf; and Weckenmann, Albert, 4,107,555, Cl. 307-308.000.

Brearley, Malcolm, to Girling Limited. Failure detection circuit for a vehicle anti-skid braking system. 4,106,821, Cl. 303-92.000.

Bremer, Hermann: *See*—
Schippers, Heinz; Lenk, Erich; Mayer, Manfred; Busch, Hans-Jochen; and Bremer, Hermann, 4,106,710, Cl. 242-18.00R.

Brendley, William H., Jr.: *See*—
Haag, Thomas H.; Brendley, William H., Jr.; and Martorano, Richard, 4,106,421, Cl. 113-120.00A.

Brenno, Lester C.: *See*—
Clausen, Victor H.; and Brenno, Lester C., 4,107,372, Cl. 428-256.000.

Brewer, William R.; Norland, Kenneth S.; and Wright, Richard F., to Polaroid Corporation. Reduced haze photochromic systems. 4,106,861, Cl. 350-354.000.

Briggs, Paul Clayton, Jr.; and Muschiatti, Lawrence Carl, to Du Pont de Nemours, E. I., and Company. Method of adhesive bonding. 4,106,971, Cl. 156-310.000.

Briggs, William D.: *See*—
Wilson, Jeffrey V.; Tucker, Leroy W.; Briggs, William D.; and Inouye, Alan T., 4,106,833, Cl. 339-29.00B.

Brimmer, Frances M.; Ahrens, Edward W.; and Magney, Herbert C. Surgical blade dispenser. 4,106,620, Cl. 206-363.000.

British Aircraft Corporation: *See*—
Walley, Gerald David, 4,106,389, Cl. 89-1.815.

British Gas Corporation: *See*—
Hudgell, Robert John, 4,107,605, Cl. 324-220.000.

British Steel Corporation: *See*—
Jackson, George, 4,106,757, Cl. 266-103.000.

Britt, Ronald Howard; De Bruin, Jan; and Boulter, David Gordon, to U.S. Philips Corporation. Sheet feeding apparatus. 4,106,765, Cl. 271-93.000.

Brochier, Michel; and Pichon, Maurice, to Commissariat a l'Energie Atomique. Vertical elecrolytic cells. 4,107,020, Cl. 204-251.000.

Brolund, Theodore F.; Scott, William B.; and Pauley, Merle R., to W. A. Whitney Corp. Combined punch press and cutting torch with workpiece supporting means. 4,106,183, Cl. 29-564.000.

Bronoel, Guy: *See—*
Percheron born Guegen, Annick; Achard, Jean Claude; Loriers, Jean; Bonnemay, Maurice; Bronoel, Guy; Sarradin, Joel; and Schlapbach, Louis, 4,107,405, Cl. 429-218.000.
Brookline Instrument Company: *See—*
DeMasters, James J.; and Musante, Victor J., 4,106,580, Cl. 177-205.000.
Brooks, Alden W., to Dayco Corporation. Method of making toothed endless power transmission belts. 4,106,966, Cl. 156-138.000.
Brower, Loyd R., Jr.; Madsen, Leonard P.; Zutaut, Chesly L.; and Barden, Walter M., Jr., to Standard T. Chemical Company, Inc. Method and apparatus for electro-phorectic coating. 4,107,016, Cl. 204-181.00R.
Brown, Frederick L., to Dow Chemical Company, The. Drying veneer with jets of superheated solvent vapor. 4,106,209, Cl. 34-9.500.
Brown, Geoffrey Edward, to Spar Aerospace Products Ltd. Linear induction motor assembly. 4,107,558, Cl. 310-13.000.
Brown, Randolph E., Jr.: *See—*
Berg, Joseph E.; and Brown, Randolph E., Jr., 4,107,350, Cl. 427-38.000.
Bruce, S. Esson: *See—*
Ratcliffe, Walter James; Kolb, Robert W.; and Bruce, S. Esson, 4,107,368, Cl. 428-245.000.
Brueck, Steven R. J.: *See—*
Kildal, Helge; and Brueck, Steven R. J., 4,107,544, Cl. 307-88.300.
Brumfield, Elvin S.; Kutzscher, Edgar W.; and Lovelady, James N., to Lockheed Aircraft Corporation. Infrared acquisition device. 4,107,530, Cl. 250-342.000.
Brundage, Richard B.; Jost, Walter P., Jr.; and Burroughs, Mortimer P., to Emerson Electric Co. Arc welding machine. 4,107,635, Cl. 336-45.000.
Brunswick Corporation: *See—*
Green, Charles Emmons, 4,106,124, Cl. 2-187.000.
Liu, William Chang; Bratton, Francis H., deceased; and Nali, Robert Ronald, 4,107,259, Cl. 264-331.000.
Brydolf, Robert: *See—*
Kellems, Kenneth K.; and Brydolf, Robert, 4,106,158, Cl. 16-129.000.
Bryngdahl, Olof; and Lee, Wai-Hon, to Xerox Corporation. Laser scanning system utilizing computer generated holograms. 4,106,844, Cl. 350-6.200.
BTR Industries Limited: *See—*
Szentmihaly, Charles, 4,106,526, Cl. 138-109.000.
Bucheck, David J.: *See—*
Lorentzen, Alan P., 4,107,051, Cl. 210-500.00R.
Buchel, Wolfgang: *See—*
Clas, Willi; and Buchel, Wolfgang, 4,107,123, Cl. 260-31.80G.
Bucher-Guyer AG Maschinenfabrik: *See—*
Schmid, Alfred, 4,106,404, Cl. 100-117.000.
Bucher, Jakob: *See—*
von Schnurbein, Eglof; Bucher, Jakob; and Mikota, Thomas, 4,106,289, Cl. 60-314.000.
Buchheit, Robert F., to Xerox Corporation. Distance compensated electrostatic voltmeter. 4,106,869, Cl. 355-3.00R.
Buchwald, Frank S.; and Melocik, Grant C., to Towmotor Corporation. Control system for a compound DC electric motor. 4,107,586, Cl. 318-426.000.
Buckingham, James Ernest, to Cam Gears Limited. Anti-roll rack bar. 4,106,363, Cl. 74-498.000.
Budnick, Donald Barry: *See—*
Spilman, Raymond; Haase, Edward Emil, Jr.; Kruger, Kurt John; Budnick, Donald Barry; and Lasorso, Vincent John, Jr., 4,106,490, Cl. 128-2.00F.
Buhrke, Fred W., to Buhrke Industries, Inc. Method for manufacture of can end closures. 4,106,422, Cl. 113-121.00C.
Buhrke Industries, Inc.: *See—*
Buhrke, Fred W., 4,106,422, Cl. 113-121.00C.
Lang, Richard L.; and Quaas, Dietmar G., 4,106,633, Cl. 214-1.0BB.
Buildinter AG: *See—*
Roqueta, Eduardo Caro, 4,106,752, Cl. 254-29.00A.
Buisson, Marcel. Method and apparatus for the transverse folding of a continuous tubular sleeve. 4,106,398, Cl. 93-84.0TW.
Bunda, Tsuchio; Niimi, Itaru; Kaneko, Yasuhisa; and Noda, Fumiyoshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Catalytic converter having vibration-resistant catalyst carrier. 4,106,913, Cl. 23-288.0FC.
Bunker Ramo Corporation: *See—*
Vladic, Daniel P., 4,106,841, Cl. 339-176.00M.
Bunnelle, Philip R., to FMC Corporation. Tool string and means for supporting and rotating the same. 4,106,575, Cl. 175-170.000.
Bunton, John Darrah; and Marsh, David John, to G.K.N. Group Services Limited. Method and apparatus for detecting contamination of liquids. 4,106,331, Cl. 73-61.10R.
Buras, Edmund Maurice, Jr.; and Harper, Allan Carl, to Gillette Company, The. Hair clipper. 4,106,190, Cl. 30-43.700.
Burchart, Samuel C. Massaging apparatus. 4,106,500, Cl. 128-36.000.
Burd & Fletcher Company: *See—*
Berger, Walter S.; Erhart, Andrew Paul; Fee, William O.; Holtgren, Darwin Lester; and Burd & Fletcher Company, 4,106,688, Cl. 229-39.00R.
Burgermann, Norbert, to AGFA-Gevaert, A.G. Motion-picture camera with diaphragm control system having fadeover capability. 4,106,864, Cl. 352-91.00C.
Burgermann, Norbert, to AGFA-Gevaert, A.G. Motion-picture camera programmed for fadeover effects. 4,106,865, Cl. 352-91.00C.
Burke, Edward F., Jr., to MFE Corporation. Tape speed control apparatus. 4,107,745, Cl. 360-73.000.
Burke, Oliver W., Jr., deceased (by Scala, Norma, administratix); and Humphreys, Victor T., to Darrah, Marion; and Houghton, Joseph Y., co-trustees. Vinylic filler pigments and processes for producing same. 4,107,126, Cl. 260-38.000.
Burke, Oliver W., Jr., deceased (by Scala, Norma, administratrix); and Humphreys, Victor T., to Darrah, Marion; and Houghton, Joseph Y., Co-Trustees. Vinylic filler products and processes for producing same. 4,107,132, Cl. 260-42.140.
Burley, Ernest G. Apparatus and process for improving fuel efficiency of an internal combustion engine utilizing a vapor state of fuel. 4,106,453, Cl. 123-120.000.
Burley, Victor George, to Cadbury Limited. Method of manufacturing a milk chocolate. 4,107,347, Cl. 426-660.000.
Burlington Industries, Inc.: *See—*
Best, Robert H.; and Harris, William D., 4,107,756, Cl. 361-231.000.
Burmesch, Gerald C.: *See—*
Peterson, James F.; Freier, Edward, Jr.; and Burmesch, Gerald C., 4,106,272, Cl. 56-202.000.
Burns, John Joseph Vincent. Electrical grounding clamp. 4,106,832, Cl. 339-14.00L.
Burroughs Corporation: *See—*
Anderson, Eric G., 4,107,593, Cl. 318-685.000.
Kruklitis, Karlis, 4,107,653, Cl. 340-146.3OC.
Marino, Francis C., 4,107,664, Cl. 340-324.0AD.
Ogle, James A.; and Holz, George E., 4,107,576, Cl. 315-169.0TV.
Ouimet, Raymond Joseph; Wojtowicz, Edward Arthur; Lund, George Edward; and Fiorentino, Ermenegildo, 4,106,636, Cl. 214-11.00R.
Zimmer, Karl Joseph, 4,107,760, Cl. 361-383.000.
Burroughs, Mortimer P.: *See—*
Brundage, Richard B.; Jost, Walter P., Jr.; and Burroughs, Mortimer P., 4,107,635, Cl. 336-45.000.
Burroughs Wellcome Co.: *See—*
Grivsky, Eugene Michael, 4,107,320, Cl. 424-274.000.
Burrows, Harvey Paul. Rotary tub grinder. 4,106,706, Cl. 241-186.200.
Burtis, Wilson A., to Wyle Laboratories. Gear pump, gear and method. 4,106,361, Cl. 74-462.000.
Burwell, Clifton J.: *See—*
Sturman, Oded E.; and Grill, Benjamin, 4,107,546, Cl. 307-141.000.
Busch, Hans-Jochen: *See—*
Schippers, Heinz; Lenk, Erich; Mayer, Manfred; Busch, Hans-Jochen; and Bremer, Hermann, 4,106,710, Cl. 242-18.00R.
Busse, Wolfgang: *See—*
Klotzner, Winfried; Daumer, Rolf; Busse, Wolfgang; and du Mont, Hans-Christoph, 4,107,717, Cl. 364-431.000.
Butler, Joseph H., Jr.: *See—*
Dolle, Alvin J.; and Butler, Joseph H., Jr., 4,106,829, Cl. 312-235.00A.
Butler, William S.: *See—*
Farris, Richard C.; and Butler, William S., 4,106,412, Cl. 105-197.0DH.
Butzow, Neil W.; and Harris, Bernhard, to Rexnord Inc. Composite article providing seamless fabric-lined bearings in multiple. 4,107,381, Cl. 428-365.000.
Buzga, Heinrich; Steprath, Werner; and Pause, Kurt, to Maschinenfabrik Buckau Aktiengesellschaft. Apparatus for washing grossly soiled products of plastic material for subsequent re-use. 4,106,518, Cl. 134-104.000.
Byrnes, Raymond G.: *See—*
Proctor, Leonard R.; and Byrnes, Raymond G., 4,106,493, Cl. 128-2.00R.
C.A. Pemberton & Co. Limited: *See—*
Ilines, Laurence James, 4,106,174, Cl. 29-239.000.
C.A.V. Limited: *See—*
Tombs, Terence Leslie; Miles, Brian Leslie; and Smith, Dexter William, 4,107,510, Cl. 219-270.000.
C. Desaga GmbH, Nachf. Erich Fecht: *See—*
Muckenmuller, Helmut; and Muth, Hubert, 4,107,027, Cl. 204-301.000.
C. Ellson & Co. Ltd.: *See—*
Ellson, Walter Gill, 4,107,514, Cl. 219-523.000.
C L Industries Inc.: *See—*
Kloster, William R.; and Stewart, Patrick H., 4,106,545, Cl. 164-18.000.
Cadbury Limited: *See—*
Burley, Victor George, 4,107,347, Cl. 426-660.000.
Cahen, Raymond N. M.: *See—*
Debande, Guy F. S.; Cahen, Raymond N. M.; and Grootjans, Jacques F. J., 4,107,225, Cl. 260-683.900.
Calamani, Sergio: *See—*
Savio, Ermanno; Calamani, Sergio; and Turri, Eugenio, 4,106,712, Cl. 242-47.010.
Calori, Giovanni, to Industrie Pirelli S.p.A. Tire molding apparatus. 4,106,888, Cl. 425-577.000.
Cam Gears Limited: *See—*
Buckingham, James Ernest, 4,106,363, Cl. 74-498.000.
Cama, Lovji D.: *See—*
Christensen, Burton G.; Cama, Lovji D.; Karady, Sandor; and Sletzinger, Meyer, 4,107,432, Cl. 544-21.000.
Cambourelis, Peter J.: *See—*
Paterson, Malcolm M.; Grubbs, Michael R.; Cambourelis, Peter J.; and Schrimper, Vernon L., 4,107,034, Cl. 209-135.000.

Camco, Incorporated: *See—*
Gatlin, Alvin O.; Tausch, Gilbert H.; and Watkins, Fred E., 4,106,563, Cl. 166-117.500.
Tausch, Gilbert H., 4,106,564, Cl. 166-117.500.
Camp, Jesse G., Jr.: *See—*
Bousquet, Donald G.; Camp, Jesse G., Jr.; Hopkins, Mortimer Gilbert; and Jagt, Leonard J., 4,106,899, Cl. 8-101.000.
Campbell, Donn V.; and Paragi, Edward J., to United States of America, Army. Antenna for phase front homing. 4,107,691, Cl. 343-120.000.
Campbell, George Thomas Richardson; Kasuga, Toshishige; and Ohno, Kosaku, to Algoship International Limited. Universal gantry crane. 4,106,641, Cl. 214-15.00R.
Campbell, Robert W.; and Cleary, James W., to Phillips Petroleum Company. High impact terephthalate copolyesters using 1,4-butanediol and 1,4-cyclohexanedimethanol. 4,107,150, Cl. 528-307.000.
Campe, William T., to Teletype Corporation. Current control system for a stepping motor. 4,107,595, Cl. 318-696.000.
Canada-Cities Service, Ltd.: *See—*
Lorenz, Gordon Ronald, 4,107,029, Cl. 208-11.0LE.
Canada, Her Majesty the Queen in right of, as represented by the Minister of Energy, Mines and Resources: *See—*
Lorenz, Gordon Ronald, 4,107,029, Cl. 208-11.0LE.
Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See—*
Hamid, Michael A., 4,106,340, Cl. 73-355.00R.
Canada Wire and Cable Limited: *See—*
Bayles, Francis Derrick; and Dudley, Michael Alan, 4,107,358, Cl. 427-379.000.
Canadian Patents and Development Limited: *See—*
Hill, Kenneth O.; Kawasaki, Brian S.; and Johnson, Derwyn C., 4,107,628, Cl. 331-94.50N.
Russell, Kenneth E.; and Vail, Linda G. M. C., 4,107,144, Cl. 526-212.000.
Swailes, G. Edward; and Struble, Dean L., 4,107,293, Cl. 424-84.000.
Cannon, John Porter, to Plattner Industries, Inc. Container closure. 4,106,665, Cl. 220-329.000.
Canon Kabushiki Kaisha: *See—*
Kobayashi, Hajime; Yano, Yasuhiro; and Endo, Ichiro, 4,106,409, Cl. 101-426.000.
Kondo, Eiichi; Katayama, Hajime; Takahashi, Toru; and Komiya, Yutaka, 4,106,870, Cl. 355-4.000.
Masaki, Katsumi; and Isaka, Yukio Inagi,, 4,107,786, Cl. 364-900.000.
Capek, George: *See—*
Scaletta, Ronald C.; and Capek, George, 4,107,634, Cl. 333-81.00A.
Capsulated Systems, Inc.: *See—*
Bayless, Robert G., 4,107,071, Cl. 252-316.000.
Carella, Vincent; and Nielsen, Edwin A., to Ideal Toy Corporation. Toy vehicle track. 4,106,695, Cl. 238-10.00F.
Carey, Thomas A.; and Ridge, George W., to International Harvester Company. Rotary knife stripper. 4,106,271, Cl. 56-119.000.
Cari-All, Inc.: *See—*
Trubiano, Antoine, 4,106,626, Cl. 206-513.000.
Caribonum Limited: *See—*
Tilson, Edward Arthur; and Mayhew, Raymond Leonard, 4,107,327, Cl. 428-304.000.
Carlqvist, Bengt Roland; and Eriksson, Anders Gunnar, to Telefonaktiebolaget L M Ericsson. Receiver apparatus for detection of two voice frequencies in a multifrequency tone signal. 4,107,475, Cl. 179-84.0VF.
Carlson, David H. J., to UOP Inc. Preparation of a supported metal phthalocyanine catalyst. 4,107,078, Cl. 252-428.000.
Carnahan, Robert D.; Holt, William C., Jr.; and Youtsey, Karl J., to UOP Inc. Novel compositions of matter. 4,107,092, Cl. 252-511.000.
Carpentier, Alain F.; and Lane, Ernest, to American Hospital Supply Corporation. Supported bioprosthetic heart valve with compliant orifice ring. 4,106,129, Cl. 3-1.500.
Carroll, James C.; and Johnson, Lewis T., to Phillips Petroleum Company. Three-level stacking container. 4,106,623, Cl. 206-506.000.
Carroll, James C.; and Johnson, Lewis T., to Phillips Petroleum Company. Molded container. 4,106,625, Cl. 206-507.000.
Carrow, Guy E., to Phillips Petroleum Company. Apparatus for attaching an insert in a mold. 4,106,745, Cl. 249-97.000.
Carter, Robert A., to General Electric Company. Timer control circuit. 4,107,553, Cl. 307-293.000.
Case, Cecil L.: *See—*
White, Allen A.; Case, Cecil L.; Ankenman, Thomas W.; and Yatcilla, George, 4,106,268, Cl. 56-1.000.
Cason, Lois Jean: *See—*
Oliphant, Howard G., 4,106,236, Cl. 49-141.000.
Cassata, Antonio: *See—*
Giannini, Umberto; Cassata, Antonio; Longi, Paolo; and Mazzocchi, Romano, 4,107,413, Cl. 526-114.000.
Giannini, Umberto; Cassata, Antonio; Longi, Paolo; and Mazzocchi, Romano, 4,107,414, Cl. 526-114.000.
Giannini, Umberto; Cassata, Antonio; Longi, Paolo; and Mazzocchi, Romano, 4,107,415, Cl. 526-114.000.
Castle, John H., to Control Marketing Associates. Water detector means for tank liquid level measuring system. 4,106,338, Cl. 73-302.000.
Castonguay, Roger N.: *See—*
Jencks, Charles L.; and Castonguay, Roger N., 4,107,497, Cl. 200-144.00R.
Caterpillar Mitsubishi Ltd.: *See—*
Yoshino, Tsuneo; and Tatsuma, Junji, 4,107,052, Cl. 210-534.000.
Caterpillar Tractor Co.: *See—*
De La Cruz Cuevas, Francisco, 4,106,224, Cl. 37-80.00A.
Eftefield, Larry G., 4,107,505, Cl. 219-76.140.
Frantzreb, John G., Sr.; and Weiss, C. David, 4,107,393, Cl. 428-558.000.
Gardner, John W.; Grgurich, William A.; and Niles, Albert B., 4,106,702, Cl. 239-533.300.
Gibson, Myron R., 4,106,169, Cl. 29-156.40R.
Goloff, Alexander, 4,106,466, Cl. 123-188.00S.
Habiger, Cyril W., 4,106,292, Cl. 60-447.000.
Hyde, Michael B., 4,106,808, Cl. 296-35.00R.
Manna, Albert, 4,106,360, Cl. 74-440.000.
Cathiard, Jean-Pierre: *See—*
Negre, Henri; and Cathiard, Jean-Pierre, 4,106,638, Cl. 214-14.000.
Catignani, Robert T., to Garcia Corporation, The. Spinning reel spool and adapter therefor. 4,106,718, Cl. 242-84.20R.
Caudill, Donald L., to Label-Aire Inc. Velocity compensator and apparatus incorporating the same. 4,106,972, Cl. 156-363.000.
Cavalieri, Michel; and Batreau, Francois, to Europe-Levage Manutention (Elma). Automatic anti-fall device for power-driven lifting machinery. 4,106,753, Cl. 254-157.000.
Cavanaugh, Robert J.; Coffee, Robert L.; Conley, Dell; and Ferrell, Howard H., to Continental Oil Company. Method and apparatus for automatic control of filtrate quality. 4,107,037, Cl. 210-82.000.
Cavin, O. Burl: *See—*
Morgan, Chester S., Jr.; Cavin, O. Burl; McCulloch, Reginald W.; and Clark, David L., 4,106,186, Cl. 29-616.000.
CBS Inc.: *See—*
Rossi, John P.; and Stern, Marvin A., 4,107,739, Cl. 358-167.000.
Cefilac: *See—*
Desverchere, Jean, 4,106,163, Cl. 19-296.000.
Celanese Corporation: *See—*
Thomas, Norman W., 4,106,926, Cl. 71-115.000.
Central Glass Company, Limited: *See—*
Fujikawa, Tomio; Funakoshi, Masayasu; and Misumi, Tadanori, 4,106,918, Cl. 55-71.000.
Centre de Recherche Industrielle du Quebec: *See—*
Charlebois, Jacques; and Lescouflair, Guy, 4,107,465, Cl. 179-1.00N.
Centre Electronique Horloger S.A.: *See—*
Martin, Jean-Claude; and Piguet, Christian, 4,106,279, Cl. 58-23.0BA.
Ceraso, Joseph M.: *See—*
Dye, James L.; Ceraso, Joseph M.; Tehan, Frederick J.; and Lok, Mei Tak, 4,107,180, Cl. 260-338.000.
Cesca, Sebastiano: *See—*
Priola, Aldo; Cesca, Sebastiano; and Ferraris, Giuseppe, 4,107,417, Cl. 526-117.000.
Ceskoslovenska akademie ved: *See—*
Stoy, Vladimir, 4,107,121, Cl. 260-29.6AB.
CGR-MeV: *See—*
Tran, Duc Tien, 4,107,617, Cl. 328-233.000.
Chabal, Joseph: *See—*
Rieser, Raymond G.; and Chabal, Joseph, 4,107,366, Cl. 428-215.000.
Chabot, Bernard T. Sea rescue chamber and methods of constructing and utilizing same. 4,106,144, Cl. 9-4.00R.
Chalesle, Andre Maurice: *See—*
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Chamberlain, Savvas Georgiou, to International Business Machines Corporation. Photodiode structure having an enhanced blue color response. 4,107,722, Cl. 357-30.000.
Chambley, Phillip Wayne: *See—*
Norris, Alan Hedley; and Chambley, Phillip Wayne, 4,106,896, Cl. 8-62.000.
Champion International Corporation: *See—*
Norris, Alan Hedley; and Chambley, Phillip Wayne, 4,106,896, Cl. 8-62.000.
Chan, David C. K.; and Whipp, Arthur A., to Chevron Research Company. Mite and mite-ovicidal compositions. 4,107,332, Cl. 424-321.000.
Chan, David Cheong King, to Chevron Research Company. Fungicidal 3-(N-acyl-N-arylamino) lactones and lactams. 4,107,323, Cl. 424-279.000.
Chan, See Ark: *See—*
Berkenblit, Melvin; Chan, See Ark; Reisman, Arnold; and Zirinsky, Stanley, 4,106,975, Cl. 156-628.000.
Chang, Yew C.; Ovshinsky, Stanford R.; and Strand, David A., to Energy Conversion Devices, Inc. Imaging and recording of information utilizing a tellurium tetrahalide complex of an aromatic amine. 4,106,939, Cl. 96-48.00R.
Charlebois, Jacques; and Lescouflair, Guy, to Centre de Recherche Industrielle du Quebec. Automatic audiometer system. 4,107,465, Cl. 179-1.00N.
Charlton, John Cecil; Glover, John Stuart; and Shepherd, Bryan Peter, to Radiochemical Centre Limited, The. Centrifuge tube and method for performing assay with same. 4,106,907, Cl. 23-230.300.
Chasins, Edward A., to Producers Row Inc. Projection screen support structure. 4,106,852, Cl. 350-117.000.
Chauthani, Abdul Rehman, to Nutrilite Products, Inc. Insecticidal composition of *Bacillus thuringiensis* admixed with 1-(4-chlorophenyl)-3-(2,6-difluorobenzoyl)-urea. 4,107,294, Cl. 424-93.000.

Chem-E-Watt Corporation: *See—*
Feld, Sheldon L., 4,106,477, Cl. 126-263.000.

Chemotronics International, Inc.: *See—*
Torbet, Christopher J.; Rice, Warren A.; and Vinton, Clarence S., 4,106,970, Cl. 156-306.000.

Cheng, Chien-Hong: *See—*
Eisenberg, Richard; and Cheng, Chien-Hong, 4,107,076, Cl. 252-373.000.

Cherepin, Valentin Tikhonovich; and Olkhovsky, Valery Leonidovich. Ion-emission microanalyzer microscope. 4,107,527, Cl. 250-309.000.

Chester, Arthur Warren, to Mobil Oil Corporation. Process for cracking hydrocarbons. 4,107,032, Cl. 208-120.000.

Chevallier, Yvonick; Martinaud, Jacques-Pierre; Meiller, Francois; and Berthoux, Jean, to Rhone-Poulenc Industries. Insoluble metallic complexes and catalysts therefrom. 4,107,079, Cl. 252-429.00R.

Chevron Research Company: *See—*
Bacskai, Robert, 4,107,154, Cl. 528-312.000.
Chan, David C. K.; and Whipp, Arthur A., 4,107,332, Cl. 424-321.000.
Chan, David Cheong King, 4,107,323, Cl. 424-279.000.
Parker, Phillip H., 4,107,361, Cl. 428-17.000.
Stayner, Robert A.; Fox, Richard C.; and Jones, Thornton K., 4,106,958, Cl. 148-23.000.

Chicklis, Evan P.; Naiman, Charles S.; and Labaugh, Kenneth D., to Sanders Associates, Inc. Dual mode seeker reticle. 4,107,529, Cl. 250-339.000.

Childress, Bobby Belton, to Pelton & Crane Company. Control arrangement for handpiece instrument. 4,106,198, Cl. 32-22.000.

Chiou, Charles; Galli, Guido; Loeffler, Karl H.; and Lorenz, Max R., to International Business Machines Corporation. Ink jet nozzle method of manufacture. 4,106,976, Cl. 156-644.000.

Chistyakova, Zoya Mikhailovna: *See—*
Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pirogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Borisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; Shevtsov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich; Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mateshin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich; Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich; Koen, David Matveevich; Seleverstov, Vladimir Vasilievich; Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pizogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Bozisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zakharovich, 4,107,449, Cl. 13-35.000.
Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pirogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Borisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; Shevtsov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich; Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mateshin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich; Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich; Koen, David Matveevich; Seleverstov, Vladimir Vasilievich; Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pizogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Bozisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zakharovich, 4,107,449, Cl. 13-35.000.

Chlanda, Frederick P.; Nagasubramanian, Krishnamurthy; and Liu, Kang-Jen, to Allied Chemical Corporation. Method for removal of SO_2 from gases. 4,107,015, Cl. 204-180.00P.

Chleboun, Thomas P., to GTE Sylvania Incorporated. Intrusion detection system. 4,107,660, Cl. 340-566.000.

Choay, Jean: *See—*
Vairel, Edmond G.; Goulay, Jean; and Choay, Jean, 4,106,992, Cl. 195-66.00B.

Choay S.A.: *See—*
Lefrancier, Pierre, 4,107,158, Cl. 260-112.50R.
Vairel, Edmond G.; Goulay, Jean; and Choay, Jean, 4,106,992, Cl. 195-66.00B.

Christ, Alfred: *See—*
Meystre, Noel; Christ, Alfred; and Miller, Helmut, 4,106,824, Cl. 308-9.000.

Christe, Karl O.; Shack, Carl J.; and Wilson, Richard D., to Rockwell International Corporation. Method for producing NF_4BF_4. 4,107,275, Cl. 423-276.000.

Christensen, Burton G.; Cama, Lovji D.; Karady, Sandor; and Sletzinger, Meyer, to Merck & Co., Inc. 7-Diacylimido cephalosporins. 4,107,432, Cl. 544-21.000.

Christenson, James Gordon, to Hoffmann-La Roche Inc. Radioimmunoassay for methaqualone. 4,107,285, Cl. 424-1.000.

Christman, David R.; Finn, Ronald D.; and Wolf, Alfred P., to United States of America, Energy. Production of carrier-free $H^{11}CN$. 4,106,982, Cl. 176-11.000.

Christopher, Van Michaels. Acetylide catalyst and process of producing hydrogen. 4,107,282, Cl. 423-657.000.

Chrysler Corporation: *See—*
Kopera, Joseph J., 4,106,460, Cl. 123-146.50D.

Chubb & Son's Lock and Safe Company Limited: *See—*
Tippin, Arthur D., 4,106,316, Cl. 70-268.000.

Churchill, Steven T., to Letot, Incorporated. Individual room energy control system. 4,107,466, Cl. 179-2.00A.

Ciba-Geigy Corporation: *See—*
Baumann, Marcus; Kvita, Vratislav; Roth, Martin; and Waterhouse, John Sidney, 4,107,174, Cl. 260-326.0NS.
Petree, Harris E.; Nabors, James B., Jr.; and Grace, Henry C., 4,106,927, Cl. 71-121.000.

Cibie Projecteurs: *See—*
Puyplat, Olivier, 4,106,969, Cl. 156-275.000.

Clark, David L.: *See—*
Morgan, Chester S., Jr.; Cavin, O. Burl; McCulloch, Reginald W.; and Clark, David L., 4,106,186, Cl. 29-616.000.

Clark, John Colin; Kennedy, James; Long, Alan Gibson; and Weir, Niall Galbraith, to Glaxo Laboratories Limited. Δ^3-3-Vinyl or substituted vinyl-4-carboxy cephalosporins. 4,107,431, Cl. 544-16.000.

Clark, Lee M. Side dumping vehicle. 4,106,812, Cl. 298-1.00B.

Clark, Otho A. Support for sprayer booms. 4,106,700, Cl. 239-168.000.

Clarke, George A.; and Harting, Gary L., to Exxon Research & Engineering Co. Pressure grease composition. 4,107,058, Cl. 252-18.000.

Clarke, William G.: *See—*
Molloy, Joseph; and Clarke, William G., 4,106,985, Cl. 176-68.000.

Clas, Willi; and Buchel, Wolfgang, to Duetsohe Gold- und Silber-Scheideanstalt vormals Roessler. Polyvinyl chloride/silicic acid/hexanetriol mixtures and process for their preparation. 4,107,123, Cl. 260-31.80G.

Clason, Jan C., to Hazemeijer B.V. Vacuum switching apparatus with double interruption and including an interposed barrier. 4,107,496, Cl. 200-144.00B.

Clausen, Victor H.; and Brenno, Lester C., to H. B. Fuller Company. Composite. 4,107,372, Cl. 428-256.000.

Claxton, Joseph Edmund, to Somerville Belkin Industries Limited. Vented cap for storage battery. 4,107,399, Cl. 429-89.000.

Clayton, John Peter: *See—*
Bentley, Peter Hubert; and Clayton, John Peter, 4,107,433, Cl. 544-30.000.

Cleary, James W.: *See—*
Campbell, Robert W.; and Cleary, James W., 4,107,150, Cl. 528-307.000.

Clemence, Francois: *See—*
Allais, Andre; Clemence, Francois; Deraedt, Roger; and Le Martret, Odile, 4,107,310, Cl. 424-258.000.

Clements, James M. Sampling tube cleaning device. 4,106,576, Cl. 175-313.000.

Cline, Ted L. Chisel plow with adjustable towing tongue and gauge wheels. 4,106,568, Cl. 172-327.000.

Clishem, Thomas A.; Olympia, Frederick D.; and Pokallus, Leonard W., to Corning Glass Works. Manufacture of improved fused cast refractory. 4,107,255, Cl. 264-299.000.

Clowers, Earl R.; and Davis, John C., to Singer Company, The. Retractable cord guiding and locking devices. 4,106,165, Cl. 24-134.00R.

Coal Industry (Patents) Limited: *See—*
Hvidsten, Jan Hagbert, 4,107,516, Cl. 235-92.0FP.

Cochran, Michael J., to Texas Instruments Incorporated. Prompting programmable calculator. 4,107,782, Cl. 364-706.000.

Cody, David L., to Symons Corporation. Adjustable shoring apparatus. 4,106,256, Cl. 52-646.000.

Coefield, Nina. Crossword puzzle game. 4,106,773, Cl. 273-240.000.

Coffee, Robert L.: *See—*
Cavanaugh, Robert J.; Coffee, Robert L.; Conley, Dell; and Ferrell, Howard H., 4,107,037, Cl. 210-82.000.

Cohen, Allen; Cohen, Howard; and Cohen, Ronald, to M. Cohen & Sons, Inc. Knock-down open riser stairway. 4,106,591, Cl. 182-93.000.

Cohen, Howard: *See—*
Cohen, Allen; Cohen, Howard; and Cohen, Ronald, 4,106,591, Cl. 182-93.000.

Cohen, Noal; and Saucy, Gabriel, to Hoffmann-La Roche Inc. Synthesis of optically active carboxylic acid esters. 4,107,183, Cl. 260-345.80R.

Cohen, Ronald: *See—*
Cohen, Allen; Cohen, Howard; and Cohen, Ronald, 4,106,591, Cl. 182-93.000.

Coin Acceptors, Inc.: *See—*
Dietz, Kristen H., 4,106,608, Cl. 194-1.00R.

Colgate-Palmolive Company: *See—*
Gray, Frederick W., 4,107,065, Cl. 252-99.000.
Klisch, Stephen Cajetan; and Martin, Charles Andrew, 4,107,095, Cl. 252-541.000.

Coltrinari, Enzo: *See—*
Baltz, John; and Coltrinari, Enzo, 4,107,261, Cl. 423-22.000.

Combustion Engineering, Inc.: *See—*
Ferrin, Charles Robert; and Manning, William Patrick, 4,107,270, Cl. 423-226.000.
Nelson, Hugh Wharton, 4,106,978, Cl. 162-1.000.

Comm/Scope Company: *See—*
Wilkenloh, Frederic Nash; Wilson, Paul Alan; and Fox, Steve Allen, 4,107,354, Cl. 427-118.000.

Commissariat a l'Energie Atomique: *See—*
Brochier, Michel; and Pichon, Maurice, 4,107,020, Cl. 204-251.000.
Dargent, Bruno; and Robert, Jacques, 4,106,858, Cl. 350-332.000.
Lauro, Fernand, 4,106,560, Cl. 165-159.000.

Communication Satellite Corporation: *See—*
van Ommering, Gerrit; and Dunlop, James D., 4,107,395, Cl. 429-21.000.

Compagnie Industrielle des Telecommunications Cit-Alcatel S.A.: *See—*
Gauriat, Gilles; Vernezy, Jacques; and Barigot, Jean-Claude, 4,107,468, Cl. 179-15.0BY.
Compunetics, Incorporated: *See—*
Bernier, Donald R., 4,107,604, Cl. 324-208.000.
Concast AG: *See—*
Fluckiger, Friedrich, 4,106,547, Cl. 164-82.000.
Inoue, Yuuji, 4,106,551, Cl. 164-448.000.
Conco Inc.: *See—*
Van Norman, John W., 4,107,738, Cl. 358-100.000.
Conic Corporation: *See—*
Stamper, Jerry Lee, 4,107,459, Cl. 178-69.100.
Conley, Dell: *See—*
Cavanaugh, Robert J.; Coffee, Robert L.; Conley, Dell; and Ferrell, Howard H., 4,107,037, Cl. 210-82.000.
Connor, David T.; Ringel, Samuel M.; and von Strandtmann, Maximilian, to Warner-Lambert Company. 1-Nor-2-amino carbamates derived from acid S, an antibiotic produced by *Polyangium cellulosum* var. *fulvum*. 4,107,429, Cl. 542-447.000.
Conrad, Wendell R.; Futamura, Shingo; and Hayes, Robert A., to Firestone Tire & Rubber Company, The. Suspension polymerization of polyurethanes and spin-molding the powder product thereof. 4,107,256, Cl. 264-310.000.
Conrad, William A., to Rheem Manufacturing Company. Apparatus for pressure testing of containers. 4,106,263, Cl. 53-97.000.
Conrow, Ransom Brown; and Bernstein, Seymour, to American Cyanamid Company. s-Phenenyltris(thioureylene)trinaphthalenetrisulfonic acid salts. 4,107,201, Cl. 260-506.000.
Conrow, Ransom Brown; and Bernstein, Seymour, to American Cyanamid Company. Substituted 4,4'-biphenylylene bis(2-thioureylene)dinaphthalenetrisulfonic acids and salts thereof. 4,107,202, Cl. 260-506.000.
Considine, Philip S.; and Whitney, Robert E., to Eikonix Corporation. Film examining with diffuse and specular illumination. 4,106,851, Cl. 350-87.000.
Consorzio Fabocart S.p.A.: *See—*
Ruffini, Guglielmo; and Pezzotti, Erio, 4,106,979, Cl. 162-73.000.
Constant, James N. Cipher computer and cryptographic system. 4,107,458, Cl. 178-22.000.
Continental Oil Company: *See—*
Cavanaugh, Robert J.; Coffee, Robert L.; Conley, Dell; and Ferrell, Howard H., 4,107,037, Cl. 210-82.000.
Scamehorn, John F.; and Porchey, David V., 4,107,421, Cl. 528-483.000.
Stafford, Jay H., 4,106,586, Cl. 181-121.000.
Woods, Warren W., 4,107,054, Cl. 252-33.400.
Contraves AG: *See—*
Schneider, Urs; and Heller, Rudolf, 4,106,219, Cl. 35-17.000.
Control Data Corporation: *See—*
Conway, David Laurence, 4,107,746, Cl. 360-78.000.
Control Marketing Associates: *See—*
Castle, John H., 4,106,338, Cl. 73-302.000.
Conway, David Laurence, to Control Data Corporation. Continuous spiral mode tracking in a conventional disk drive using concentric servo tracks. 4,107,746, Cl. 360-78.000.
Conwell, Esther M.; Kermisch, Dorian; Maher, James C.; Pfister, Gustav R.; and Schank, Richard L., to Xerox Corporation. Elastomer wave guide optical modulators. 4,106,848, Cl. 350-96.140.
Cook, Edward H., Jr.: *See—*
D'Agostino, Vincent F.; Lee, Joseph Y.; and Cook, Edward H., Jr., 4,107,005, Cl. 204-98.000.
Cook, Francis W., Jr.: *See—*
Gurdak, Felix J.; and Cook, Francis W., Jr., 4,106,375, Cl. 82-21.00B.
Cook, Harry, to United States of America, Army. Solid state barometric altimeter-encoder. 4,106,343, Cl. 73-387.000.
Cook, Ronald Janney, to Sybron Corporation. Latching hinge for kilns. 4,106,159, Cl. 16-146.000.
Cook, William W.: *See—*
Salter, Peter W.; and Cook, William W., 4,106,505, Cl. 128-206.000.
Cooley, Austin G. Optical scanning system utilizing an oscillating lens and mirror. 4,107,740, Cl. 358-293.000.
Coon, Bryan H., to Martin Marietta Corporation. Lens element incorporating narrow bandpass filter and usable in dual mode. 4,106,855, Cl. 350-196.000.
Cooper, Bryan Ewart; and Millard, Paul Lance, to Dow Corning Limited. Aqueous compositions. 4,106,948, Cl. 106-197.00R.
Cooper, Earl A., to Automation Industries, Inc. Electrical connector and frequency shielding means therefor and method of making same. 4,106,839, Cl. 339-143.00R.
Cooper, James Everett, Jr.: *See—*
Huntington, Robert Charles; and Cooper, James Everett, Jr., 4,107,671, Cl. 340-347.0DA.
Cooper, Peter Raymond, to Rank Organisation Limited, The. Optoelectric device. 4,107,517, Cl. 250-199.000.
Coquerel, Michel Jacques Leon, to Equipment Industriel Normand. Self-acting device for stopping filling of tanks with fluid products. 4,106,536, Cl. 141-220.000.
Corbellini, Glauco. Procedure for obtaining elements to support the wire in continuous forming tables of paper-making machines, and the elements derived thereby for supporting the wire. 4,106,981, Cl. 162-352.000.
Corder, Thomas E., to Teledyne Industries, Inc. Water purifier. 4,107,046, Cl. 210-282.000.
Cormack, Alexander D.; and Kool, Boris, to Beloit Corporation. Device for temporarily sealing and supporting shafts. 4,106,778, Cl. 277-9.500.
Corman, Guy, to Boussois Souchon Neuvesel Gervais Danone (Societe Anonyme). Equipment for automatically monitoring the verticality of bottles. 4,107,523, Cl. 250-223.00B.
Cornell, Robert J., to Uniroyal, Inc. ABS Composition having improved impact strength and weather aging resistance and latex suspension process therefor. 4,107,234, Cl. 260-876.00R.
Corning Glass Works: *See—*
Clishem, Thomas A.; Olympia, Frederick D.; and Pokallus, Leonard W., 4,107,255, Cl. 264-299.000.
Corpew, Charles Robert, to Stromberg Datagraphix, Inc. Character selector for a shaped beam cathode ray tube. 4,107,582, Cl. 315-365.000.
Cortex Research Corporation: *See—*
Fosslien, Egil, 4,106,155, Cl. 15-321.000.
Cory, Halsey W., to Force Control Industries, Inc. Variable speed drive. 4,106,606, Cl. 192-113.00B.
Costin, Darryl J., to Owens-Corning Fiberglas Corporation. Refractories and methods of making same. 4,107,450, Cl. 13-35.000.
Courier de Mere, Henri, to Biscosa Societe de Recherche. Transistor crystal oscillator which may be paired for generating a beat frequency. 4,107,625, Cl. 331-37.000.
Couture, Paul A., to Holland Thread Co. Spool for thread or the like. 4,106,723, Cl. 242-118.300.
Cowdery, Ray; and Larsen, Johan M., to Hukuba Kogyo Kabushiki Kaisha. Carpet sweeper. 4,106,151, Cl. 15-42.000.
Cox, David A.; Gymer, Geoffrey E.; and Shroot, Braham, to Pfeizer Inc. Antifungal thio-alkyl-imidazole derivatives. 4,107,314, Cl. 424-263.000.
Cox, Jerry H.; and Thomas, Robert F. Ramp device to reduce wear on trojan bar dogs and wheel lugs in an irrigation valley center pivot water drive. 4,106,355, Cl. 74-99.00A.
Cox, Percy T.: *See—*
Meador, Richard A.; Adams, Larry L.; Cox, Percy T.; Thompson, Larry W.; and Fuchs, James A., 4,107,597, Cl. 324-6.000.
Meador, Richard A.; Adams, Larry L.; Fuchs, James A.; Cox, Percy T.; and Thompson, Larry W., 4,107,598, Cl. 324-6.000.
Creative Dispensing Systems, Inc.: *See—*
McKinney, James C., 4,107,043, Cl. 210-232.000.
Creusot-Loire Enterprises: *See—*
Leroy, Pierre; Maubon, Andre; and Saleil, Jean, 4,106,758, Cl. 266-158.000.
Croft Metals, Inc.: *See—*
Bancroft, Joseph C.; and Hallin, Peter R., 4,106,239, Cl. 49-449.000.
Crook, Edward J., Jr., to American Hoist & Derrick Company. Spring-biased split-sleeve coupling pin retainer. 4,106,284, Cl. 59-85.000.
Crosby, Robert J., to Horizons Incorporated a division of Horizons Research Incorporated. Electrooptic meter pointer position detector. 4,107,661, Cl. 340-688.000.
Crouzet: *See—*
Jouret, Edouard Leon Clement, 4,107,483, Cl. 200-35.00R.
Crown Zellerbach Corporation: *See—*
Hartbauer, Ellsworth A.; Weis, Rudolf R.; and Kemp, Horace N., 4,106,684, Cl. 226-91.000.
Crummett, James G., to Atari, Inc. Potentiometer joystick. 4,107,642, Cl. 338-128.000.
Cumings, Francis J.: *See—*
Kevorkian, Victor; and Cumings, Francis J., 4,106,997, Cl. 201-32.000.
Cummings, Gary Eugene; Harvey, Gary Lee; and Dean, Charles Wallace, to Dean Steel Buildings, Inc. Self-interlocking standing seam for a building panel. 4,106,250, Cl. 52-394.000.
Cunliffe, Anthony Vernon; Pearce, Peter John; and Richards, David Hugh, to National Research Development Corporation. Epoxide materials. 4,107,142, Cl. 528-93.000.
Cunningham, Francis V.; and Fanizza, Michael A., to Joslyn Mfg. and Supply Co. Surge protector. 4,107,567, Cl. 313-325.000.
Cuny, Francis: *See—*
Schultz, Jean-Pierre; Cuny, Francis; Payraudeau, Daniel; and Tritz, Jean-Marie, 4,107,507, Cl. 219-121.00P.
Currie, John Alexander; McKenna, Maurice; and Upton, John Howard, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Industry in Her Britannic Majesty's Government of the. Fluid pressure control. 4,106,525, Cl. 138-43.000.
Currin, Cedric G., to Dow Corning Corporation. Solar still. 4,107,000, Cl. 202-188.000.
Curt G. Joa, Inc.: *See—*
Hirsch, John L., 4,106,974, Cl. 156-504.000.
Curtis, John Markley, Jr.; and Shepler, Paul Roberts, to Koppers Company, Inc. Double taper piston. 4,106,463, Cl. 123-193.00P.
Cushenette, Carol A.: *See—*
Shirn, George A.; Linzey, Raynor; and Cushenette, Carol A., 4,107,758, Cl. 361-275.000.
Czaja, Julius. Thermodynamic process and latent heat engine. 4,106,294, Cl. 60-649.000.
Dacom, Inc.: *See—*
Weber, Donald R., 4,107,610, Cl. 325-38.00R.
D'Agostino, Vincent F.; Lee, Joseph Y.; and Cook, Edward H., Jr., to Hooker Chemicals & Plastics Corporation; and RAI Research Corporation, part interest to each. Process for electrolysing sodium chloride or hydrochloric acid, an and electrolytic cell, employing trifluorostyrene sulfonic acid membrane. 4,107,005, Cl. 204-98.000.
Dahlen, Richard R.: *See—*
Schmitt, Joseph J.; Dahlen, Richard R.; and Lindblad, David A., 4,106,905, Cl. 21-60.50R.

Dahm, Manfred; and Jautelat, Manfred, to Bayer Aktiengesellschaft. Highly elastic polyurethane foams and process for making them. 4,107,102, Cl. 521-163.000.

Dainippon Ink & Chemicals, Inc.: *See*—
Sawai, Hideo; Hirabayashi, Satoshi; and Sato, Shigezi, 4,107,133, Cl. 260-42.150.

Dame, Richard E., to Mega Analytical Research Services, Inc. Adjustable solar concentrator. 4,106,484, Cl. 126-271.000.

Dancilovic-Matulas, Visnja: *See*—
Gaumann, Andreas F.; and Dancilovic-Matulas, Visnja, 4,107,007, Cl. 204-116.000.

Danfoss A/S: *See*—
Hansen, Gunnar Lyshoj; and Sturlason, Leif Viggo, 4,106,883, Cl. 418-61.00B.
Nielsen, Leif, 4,106,691, Cl. 236-92.00B.
Stannow, Jorgen Christian; and Tankred, Hans Jurgen, 4,106,881, Cl. 417-363.000.

Darash, Raymond N., to Weatherhead Company, The. Turbulence amplifier baffle. 4,107,048, Cl. 210-407.000.

Dare Pafco, Inc.: *See*—
Thurman, Paul G., 4,106,624, Cl. 206-507.000.

Dargan, Evander E.: *See*—
Jack, Clyde A.; and Dargan, Evander E., 4,106,254, Cl. 52-574.000.

Dargent, Bruno; and Robert, Jacques, to Commissariat a l'Energie Atomique. Liquid crystal display apparatus. 4,106,858, Cl. 350-332.000.

da Rosa, Aldo Vieira. Process for production of ammonia. 4,107,277, Cl. 423-359.000.

Darrah, Marion: *See*—
Burke, Oliver W., Jr., deceased; and Humphreys, Victor T., 4,107,126, Cl. 260-38.000.
Burke, Oliver W., Jr., deceased; and Humphreys, Victor T., 4,107,132, Cl. 260-42.140.

Data Electronics, Inc.: *See*—
Valliant, William W.; and Michelson, Manfred G., 4,106,686, Cl. 226-188.000.

Daumer, Rolf: *See*—
Klotzner, Winfried; Daumer, Rolf; Busse, Wolfgang; and du Mont, Hans-Christoph, 4,107,717, Cl. 364-431.000.

Dautov, Tulkibai Galikbarovich: *See*—
Fasman, Anatoly Borisovich; Sokolsky, Dmitry Vladimirovich; Rutman, Grigory Iocifovich; Michurov, Jury Ivanovich; Zavorin, Viktor Anatolievich; Shalimova, Zoya Stepanovna; Timofeeva, Venera Fatykhovna; Dautov, Tulkibai Galikbarovich; Bazhakov, Daniel Kalimullovich; and Sivakov, Jury Mikhailovich, 4,107,090, Cl. 252-465.000.

David, Donald J.; and Willson, Michael C., to Monsanto Research Corporation. Chemical analysis with coated, light waveguide under humidity control. 4,106,909, Cl. 23-232.00R.

Davies, David S.: *See*—
Lueders, Robert E.; Kust, Roger N.; and Davies, David S., 4,107,262, Cl. 423-32.000.

Davis, Bernard Harpley, to H. H. Robertson Company. Apparatus for filling the cells of an expanded cellular core member with granular insulation. 4,106,535, Cl. 141-88.000.

Davis, Bill G., to Jetco, Inc. Pressure ratio valve. 4,106,468, Cl. 123-196.00S.

Davis, Curry Beach: *See*—
Schluenz, Robert William; and Davis, Curry Beach, 4,107,420, Cl. 526-237.000.

Davis, John C.: *See*—
Clowers, Earl R.; and Davis, John C., 4,106,165, Cl. 24-134.00R.

Davis, Larry: *See*—
Effland, Richard C.; Davis, Larry; and Schaub, Wolfgang, 4,107,074, Cl. 260-326.50B.
Effland, Richard C.; Davis, Larry; and Schaub, Wolfgang, 4,107,187, Cl. 260-326.290.

Davis, Michael, to Airway Industries, Inc. Compartmental luggage case and method of making. 4,106,598, Cl. 190-52.000.

Davis, Michael W. Finisher's mandrel. 4,106,784, Cl. 279-2.00R.

Davis, Robert H.: *See*—
Schick, John W.; and Davis, Robert H., 4,107,060, Cl. 252-49.300.

Davison, Sol: *See*—
Gergen, William P.; and Davison, Sol, 4,107,130, Cl. 260-40.00R.
Gergen, William P.; and Davison, Sol, 4,107,131, Cl. 260-40.0TN.

Dawans, Francois, to Institut Francais Du Petrole. Polybutadiene compositions containing reinforcing glass microspheres and carbon fibers. 4,107,134, Cl. 260-42.170.

Dawn, Frederic S.; and Sauers, Dale G., to United States of America, Administrator, National Aeronautics and Space Administration. Lightweight electrically-powered flexible thermal laminate. 4,107,363, Cl. 428-109.000.

Dawson, Daniel Joseph: *See*—
Otteson, Kenneth Melvin; and Dawson, Daniel Joseph, 4,107,336, Cl. 426-250.000.

Dawson, William P., to Texscan Corporation. Attenuator element. 4,107,632, Cl. 333-81.00A.

Dayco Corporation: *See*—
Brooks, Alden W., 4,106,966, Cl. 156-138.000.
Logan, Arthur D.; and Rush, James B., 4,106,967, Cl. 156-184.000.

De La Cruz Cuevas, Francisco, to Caterpillar Tractor Co. Cutting assembly. 4,106,224, Cl. 37-80.00A.

Dean, Charles Wallace: *See*—
Cummings, Gary Eugene; Harvey, Gary Lee; and Dean, Charles Wallace, 4,106,250, Cl. 52-394.000.

Dean Steel Buildings, Inc.: *See*—
Cummings, Gary Eugene; Harvey, Gary Lee; and Dean, Charles Wallace, 4,106,250, Cl. 52-394.000.

Dean, William Bruce, to Johnson & Johnson. Woven fabric that is relatively stiff in one direction and relatively flexible in the other. 4,107,371, Cl. 428-255.000.

Debande, Guy F. S.; Cahen, Raymond N. M.; and Grootjans, Jacques F. J., to Labofina S.A. Hydrogenation process of olefin polymers for producing white oils. 4,107,225, Cl. 260-683.900.

De Bartolo, Paul I. Apparatus for precisely indexing the orientation of a portion of a device with respect to a support structure of the device. 4,106,240, Cl. 51-125.000.

De Bella, Gasper V. Engine-generator mounting for a vehicle. 4,106,582, Cl. 180-64.00A.

de Brebisson, Michel; and Bonis, Maurice, to U.S. Philips Corporation. Method of manufacturing transistors by means of ion implantation. 4,106,954, Cl. 148-1.500.

De Bruin, Jan: *See*—
Britt, Ronald Howard; De Bruin, Jan; and Boulter, David Gordon, 4,106,765, Cl. 271-93.000.

Dedinas, Jonas: *See*—
Fletcher, George Leland, Jr.; and Dedinas, Jonas, 4,106,938, Cl. 96-48.0HD.

DeKerlegand, Deke E., to Lamb, W. C. Ultrasonic inspection apparatus for tubular members and method. 4,106,347, Cl. 73-622.000.

Del Mar Avionics: *See*—
Kennedy, Harold L., 4,106,495, Cl. 128-2.06V.

De Lima Castro Neto, Eduardo. One piece security seal and new sealing system. 4,106,801, Cl. 292-307.00R.

Delker, Wilfried, to American Standard Inc. Water distributor for siphon closet. 4,106,131, Cl. 4-1.000.

Dell, William C. Fluidized bed ladle heating method and apparatus. 4,106,755, Cl. 266-44.000.

Dellorfano, Fred M., Jr.: *See*—
Massa, Donald P., 4,107,659, Cl. 340-552.000.

Delmore, Paul John: *See*—
Everts, Clifford Leon; Taylor, David Michael; and Delmore, Paul John, 4,107,070, Cl. 252-301.40S.

DeMag Aktiengesellschaft: *See*—
Ruder, Joachim, 4,107,794, Cl. 366-346.000.

DeMasters, James J.; and Musante, Victor J., to Brookline Instrument Company. Force measuring apparatus. 4,106,580, Cl. 177-205.000.

Deml, Dieter: *See*—
Ruf, Herbert; Deml, Dieter; and Schwarz, Werner, 4,107,574, Cl. 315-3.500.

Dendinger, Dennis W. Adjustable bulkhead for concrete wall forms. 4,106,743, Cl. 249-34.000.

Dent, Richard G.; and Stack, Gary F., to General Motors Corporation. Pressure vessel. 4,106,659, Cl. 220-67.000.

Dentsply Research & Development Corp.: *See*—
McCandless, William; Leu, Robert F.; Kroder, Ernest A.; and Tomecek, Charles J., 4,106,242, Cl. 51-225.000.

Deppner, Frederick W., Jr., to Western Dairy Products Division of Chelsea Industries, Inc. Sausage product simulating bacon and method of making. 4,107,337, Cl. 426-266.000.

Deraedt, Roger: *See*—
Allais, Andre; Clemence, Francois; Deraedt, Roger; and Le Martret, Odile, 4,107,310, Cl. 424-258.000.

Desverchere, Jean, to Cefilac. Apparatus for the dry production of non-woven webs. 4,106,163, Cl. 19-296.000.

Deutschmann, Herbert; and Schier, Karl, to Motoren-und Turbinen-Union Friedrichshafen GmbH. Individual cylinder head. 4,106,444, Cl. 123-41.82R.

Devine, Robert W.: *See*—
Boyett, Vernon Hugo; and Devine, Robert W., 4,106,207, Cl. 33-286.000.

DeVittorio, Joseph M., to Ransburg Corporation. Balance correction method and apparatus. 4,106,964, Cl. 156-75.000.

DeWitt, Walter Groesbeck, III, to Rohm and Haas Company. High impact resistant acrylic coating compositions and coated articles. 4,107,235, Cl. 260-876.00R.

Dextec Metallurgical Proprietary Limited: *See*—
Everett, Peter Kenneth, 4,107,009, Cl. 204-129.000.

Dexter, Robert A.: *See*—
Miller, Jerold R., 4,106,372, Cl. 81-143.000.

Dey, James. Automatic motor kill system. 4,106,469, Cl. 123-198.0DB.

Diamanti, Enrico, to SIGMA-TAU Industrie Farmaceutiche Riunite S.p.A. Fluorurated amides of nicotinic acid and the process for the preparation thereof. 4,107,316, Cl. 424-266.000.

Diamond Shamrock Corporation: *See*—
Strempel, Thomas G.; and Hora, Charles J., 4,107,022, Cl. 204-265.000.

Dichter, Michael: *See*—
Horowitz, Carl; Dichter, Michael; Duryodhan, Mangara J.; and Ioria, Joseph A., 4,107,228, Cl. 260-836.000.

Dickson, Richard E. Barrel cart and stand. 4,106,648, Cl. 214-372.000.

Dicoi, Ovidiu; and Doerr, Erwin, to Zimmer Aktiengesellschaft. Continuous process for the recovery of caprolactam. 4,107,160, Cl. 260-239.30A.

Dieck, Ronald L.; and Quinn, Edwin J., to Armstrong Cork Company. Polyphosphazene plasticized resins. 4,107,108, Cl. 521-85.000.

Dieck, Ronald L.; Magnusson, Alan B.; and Quinn, Edwin J., to Armstrong Cork Company. Curable aryloxyphosphazene polymers. 4,107,146, Cl. 528-168.000.

Dieckermann, Friedhelm, to Borg-Warner-Stieber GmbH. Free-wheel clutch. 4,106,602, Cl. 192-45.000.

Diedershagen, Bruno; and Gubela, Hans, to Gubela Strassenausrustungs-GmbH. Knockover roadway marker post. 4,106,879, Cl. 404-10.000.
Diesch, Robert E., to Pako Corporation. Paper drive mechanism for automatic photographic paper cutter. 4,106,716, Cl. 242-75.430.
Diesel Kiki Co., Ltd.: *See—*
Matsubara, Hiroshi, 4,106,584, Cl. 180-105.00E.
Dieterich, Dieter: *See—*
Traubel, Harro; Reiff, Helmut; and Dieterich, Dieter, 4,106,897, Cl. 8-94.330.
Traubel, Harro; Keiff, Helmut; and Dieterich, Dieter, 4,106,898, Cl. 8-94.330.
Dietrich, Ralph N.: *See—*
Whittington, Billy J.; Robinson, John William; and Dietrich, Ralph N., 4,106,384, Cl. 84-1.190.
Dietz, Kristen H., to Coin Acceptors, Inc. Gate assembly for a coin selecting and separating device. 4,106,608, Cl. 194-1.00R.
Digilio, Frank A.: *See—*
Angelichio, Gerald A.; and Digilio, Frank A., 4,106,406, Cl. 101-93.310.
DiGirolamo, John, to Jerome Industries Corporation. Plug-in adaptor. 4,107,636, Cl. 336-92.000.
Dill, Walter R.; and Elphingstone, Eugene A., to Halliburton Company. Method of preparing and using acidizing and fracturing compositions, and fluid loss additives for use therein. 4,107,057, Cl. 252-8.55C.
DiLorenzo, James Vincent; Niehaus, William Charles; and Varnerin, Lawrence John, Jr., to Bell Telephone Laboratories, Incorporated. Producing high efficiency gallium arsenide IMPATT diodes utilizing a gas injection system. 4,106,959, Cl. 148-175.000.
DiMarco, Bernard: *See—*
Keller, Frank R.; Kussy, Frank W.; DiMarco, Bernard; and Fenneteau, Michel M., 4,107,488, Cl. 200-50.00A.
Dinsdale, Raymond, to Rolls-Royce Limited. Method and apparatus for controlling an electro-discharge machine tool. 4,107,504, Cl. 219-69.00E.
Dion-Biro, Guy, to Biro Fils. Process for the utilization of low and medium expanded foam for the extinction of fires from liquefied products. 4,106,566, Cl. 169-44.000.
Distler, Georg; and Guetzl, Horst, to Siemens Aktiengesellschaft. Time switch device for X-ray diagnostic equipment. 4,107,500, Cl. 200-308.000.
Dittmar, Wilfried, to WERSI-electronic GmbH & Co. Kommanditgesellschaft. Register arrangement for an electronic musical instrument. 4,106,383, Cl. 84-1.010.
Dix, Rollin C.: *See—*
Proctor, Leonard R.; Dix, Rollin C.; and Metz, Werner A., 4,106,496, Cl. 128-2.00R.
Dixon, Guy E.; and Dixon, Thomas M., to Panelfold, Inc. Electrically operated folding partition. 4,106,544, Cl. 160-199.000.
Dixon, Thomas M.: *See—*
Dixon, Guy E.; and Dixon, Thomas M., 4,106,544, Cl. 160-199.000.
Dr. Kurt Herberts & Co. Gesellschaft Mit Mit Beschrankter Haftung Vorm. Otto Louis Becker: *See—*
Merchant, Suresh; Winkler, Diethard; and Bluhm, Marita, 4,107,355, Cl. 427-120.000.
Dodd, Laura M. Haltered cover garment for nursing mothers. 4,106,122, Cl. 2-104.000.
Dodge, Marlow W.: *See—*
Johnson, Arthur L., Jr.; and Dodge, Marlow W., 4,106,392, Cl. 92-128.000.
Dodson, James C.; and Labyer, Harold S., to Halliburton Company. Clamp - self alignment. 4,106,393, Cl. 92-168.000.
Doerr, Erwin: *See—*
Dicoi, Ovidiu; and Doerr, Erwin, 4,107,160, Cl. 260-239.30A.
Dogliotti, Amilcare, to P. Ferrero & C. S.p.A. Container usable as a toy construction element. 4,106,657, Cl. 220-23.400.
Dohanyos, John A. Shielded lock assembly. 4,106,315, Cl. 70-56.000.
Doherty, Thomas E.: *See—*
Amberg, Stephen W.; and Doherty, Thomas E., 4,106,397, Cl. 93-55.10R.
Dohmeier, Hans Otto, to Dome Inventions (Proprietary) Limited. Tire protective chains. 4,106,542, Cl. 152-239.000.
Doi, Yoshikazu: *See—*
Furutani, Nagahisa; Takahara, Kazuo; Doi, Yoshikazu; and Yokouchi, Haruo, 4,107,621, Cl. 330-296.000.
Dolle, Alvin J.; and Butler, Joseph H., Jr. Portable motor vehicle drink cooler, caddy and armrest. 4,106,829, Cl. 312-235.00A.
Dollinger, Robert E.; Wright, Clinton M.; and Ruble, Theodore A., deceased (by Ruble, Eulalia Berry, executrix), to Sid Richardson Carbon & Gasoline Co. Carbon black reactor with axial flow burner. 4,106,912, Cl. 23-259.500.
Dome Inventions (Proprietary) Limited: *See—*
Dohmeier, Hans Otto, 4,106,542, Cl. 152-239.000.
Dominion Textile Limited: *See—*
Ratcliffe, Walter James; Kolb, Robert W.; and Bruce, S. Esson, 4,107,368, Cl. 428-245.000.
Donahue, Paul E.: *See—*
Williams, Frank J., III; and Donahue, Paul E., 4,107,147, Cl. 528-172.000.
Donoghue, Robert J. Apparatus for measuring and dispensing liquid. 4,106,673, Cl. 222-207.000.
Donohue, James M.: *See—*
Fisk, Bernard C.; and Donohue, James M., 4,107,779, Cl. 364-518.000.
Donohue, Paul Christopher, to Du Pont de Nemours, E. I., and Company. Perovskite-type compositions containing pentavalent Ru. 4,107,163, Cl. 423-263.000.
Doriguzzi, Rino; Egloff, Markus; Kaufmann, Meinolph; Nehring, Jurgen; and Scheffer, Terry J., to BBC Brown Boveri & Company Limited. Reflector with light-scattering surface for liquid-crystal displays and method for their manufacture. 4,106,859, Cl. 350-338.000.
Dorr-Oliver Incorporated: *See—*
Freeman, Mark P., 4,107,026, Cl. 204-300.00R.
Jukkola, Walfred Wilhelm, 4,106,210, Cl. 34-10.000.
Dosco Overseas Engineering Limited: *See—*
Dunn, Eric James, 4,106,815, Cl. 299-59.000.
Dougherty, Thomas John; Hennen, Roy Erving; and Pierson, John Ronald, to Globe-Union Inc. Battery and battery container having air-flow passages therethrough. 4,107,402, Cl. 429-120.000.
Dougherty, Timothy Stephen, to Western Electric Company, Inc. Methods of working expandable thermoplastic materials in an extruder. 4,107,260, Cl. 264-349.000.
Dow Chemical Company, The: *See—*
Brown, Frederick L., 4,106,209, Cl. 34-9.500.
Freiter, Edward R., 4,107,210, Cl. 260-590.00E.
Greenawalt, Eddie Lee, 4,106,261, Cl. 53-27.000.
Southard, Robert W., 4,106,139, Cl. 5-186.00R.
Sunder, Shyam; and Peet, Norton P., 4,107,436, Cl. 544-169.000.
Tasto, William D.; and Morris, Thomas E., 4,107,221, Cl. 260-652.00P.
Dow Corning Corporation: *See—*
Currin, Cedric G., 4,107,000, Cl. 202-188.000.
Frye, Cecil L.; and Lane, Thomas H., 4,107,196, Cl. 260-448.20N.
Gordon, David J.; and Ziemelis, Maris J., 4,107,390, Cl. 428-447.000.
Saam, John C.; and Ward, Andrew H., 4,107,227, Cl. 260-827.000.
Dow Corning Limited: *See—*
Cooper, Bryan Ewart; and Millard, Paul Lance, 4,106,948, Cl. 106-197.00R.
Dow, Jerome P., to United States of America, Energy. Method for establishing high permeability flow path between boreholes. 4,106,574, Cl. 175-4.570.
Doyle, Michael A.; and Ekey, Paul E. Can display holder. 4,106,629, Cl. 211-71.000.
Dracon Industries: *See—*
Pierce, Ben Arthur, 4,107,473, Cl. 179-18.0BF.
Dragan, William B. Orthodontic O-ring dispenser and ligator therefor. 4,106,374, Cl. 81-302.000.
Draiswerke GmbH: *See—*
Durr, Herbert, 4,107,792, Cl. 366-302.000.
Drejza, John Edward; and Riley, Joseph Vincent, to International Business Machines Corporation. Disk printer inking mechanism. 4,106,873, Cl. 400-470.000.
Dresser Industries, Inc.: *See—*
Blackwell, Henry Wayne, 4,106,182, Cl. 29-460.000.
Dubeck, Michael; and Brackenridge, David R., to Ethyl Corporation. Halogenated xylenes. 4,107,104, Cl. 521-171.000.
Ducret, Alain; and Chalesle, Andre Maurice, to Regie Nationale des Usines Renault. Bearing with two rows of rolling elements including method of mounting bearing. 4,106,827, Cl. 308-187.100.
Dudley, Michael Alan: *See—*
Bayles, Francis Derrick; and Dudley, Michael Alan, 4,107,358, Cl. 427-379.000.
Duetsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Knorre, Helmut; Fischer, Joachim; and Pohl, Gerhard, 4,107,274, Cl. 423-268.000.
Duetsohe Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Clas, Willi; and Buchel, Wolfgang, 4,107,123, Cl. 260-31.80G.
Dufaure, Pierre: *See—*
Jacquet, Bernard; Papantoniou, Christos; Dufaure, Pierre; and Mahieu, Claude, 4,107,290, Cl. 424-47.000.
Duggins, Ray B.; and Westerman, Richard V., to Du Pont de Nemours, E. I., and Company. Decorative polymeric article containing flock fibers. 4,107,135, Cl. 260-42.370.
Dukess, Joseph. Method of co-extrusion with foam core. 4,107,247, Cl. 264-45.900.
Dulux Australia Ltd.: *See—*
Gibson, David Vincent; and Leary, Bruce, 4,107,113, Cl. 260-18.0PF.
du Mont, Hans-Christoph: *See—*
Klotzner, Winfried; Daumer, Rolf; Busse, Wolfgang; and du Mont, Hans-Christoph, 4,107,717, Cl. 364-431.000.
Dunleavy, Raymond Augustine; and Papa, Anthony Joseph, to Union Carbide Corporation. Phenol-aldehyde-amine resin/glycol curatives for energy absorbing polyurethanes. 4,107,106, Cl. 521-164.000.
Dunlop, James D.: *See—*
van Ommering, Gerrit; and Dunlop, James D., 4,107,395, Cl. 429-21.000.
Dunn, Eric James, to Dosco Overseas Engineering Limited. Mining machines. 4,106,815, Cl. 299-59.000.
Dunn, George T.: *See—*
Kutnyak, Thomas A.; Dunn, George T.; and Guiles, Chester L., 4,106,968, Cl. 156-189.000.
Du Pont de Nemours, E. I., and Company: *See—*
Aldrich, Paul Edward; and Berezin, Gilbert Harvey, 4,107,303, Cl. 424-244.000.
Bellina, Russell Frank; and Fost, Dennis Lynn, 4,107,325, Cl. 424-301.000.
Briggs, Paul Clayton, Jr.; and Muschiatti, Lawrence Carl, 4,106,971, Cl. 156-310.000.

Donohue, Paul Christopher, 4,107,163, Cl. 423-263.000.
Duggins, Ray B.; and Westerman, Richard V., 4,107,135, Cl. 260-42.370.
Fremont, Joseph Melvin, 4,107,082, Cl. 252-431.00R.
Kassal, Robert James, 4,107,109, Cl. 260-4.00R.
Lovejoy, Elwyn Raymond, 4,107,125, Cl. 260-37.00N.
Malhotra, Satish Chandra, 4,107,194, Cl. 260-42.180.
Martin, Elmore Louis, 4,107,444, Cl. 568-807.000.
Wang, Victor Kai-Kuo, 4,107,278, Cl. 423-376.000.

Durant, Graham John; Ganellin, Charon Robin; and Young, Rodney Christopher, to Smith Kline & French Laboratories Limited. Pharmacologically active compounds. 4,107,319, Cl. 424-273.00R.

Durr, Herbert, to Draiswerke GmbH. Apparatus for discontinuous mixing of at least two materials. 4,107,792, Cl. 366-302.000.

Duryodhan, Mangara J.: *See*—
Horowitz, Carl; Dichter, Michael; Duryodhan, Mangara J.; and Ioria, Joseph A., 4,107,228, Cl. 260-836.000.

Dwyer, Francis G., to Mobil Oil Corporation. Manufacture of ethyl benzene. 4,107,224, Cl. 260-671.00R.

Dye, James L.; Ceraso, Joseph M.; Tehan, Frederick J.; and Lok, Mei Tak, to United States of America, Energy. Salts of alkali metal anions and process of preparing same. 4,107,180, Cl. 260-338.000.

Dynamit Nobel Aktiengesellschaft: *See*—
Brachert, Heinrich; and Eich, Johannes, 4,106,960, Cl. 149-11.000.
Schrage, Klaus, 4,107,169, Cl. 260-304.00P.

Dynapol: *See*—
Otteson, Kenneth Melvin; and Dawson, Daniel Joseph, 4,107,336, Cl. 426-250.000.

Dziedzic, Harry: *See*—
Thiel, William A.; and Dziedzic, Harry, 4,107,763, Cl. 362-32.000.

E. R. Squibb & Sons, Inc.: *See*—
Sprague, Peter W.; and Heikes, James E., 4,107,175, Cl. 260-327.00M.

E-Systems, Inc.: *See*—
Watson, Charles A., Jr., 4,107,684, Cl. 343-7.500.

E. T. Marler Limited: *See*—
Reed, Kenneth James; and Pointon, David Wellings, 4,107,365, Cl. 428-202.000.

Eastman Kodak Company: *See*—
Bartlett, Lawrence C., 4,106,437, Cl. 118-412.000.
Everts, Clifford Leon; Taylor, David Michael; and Delmore, Paul John, 4,107,070, Cl. 252-301.40S.
Fletcher, George Leland; and Merrill, Stewart H., 4,107,155, Cl. 528-373.000.
Fletcher, George Leland, Jr.; and Dedinas, Jonas, 4,106,938, Cl. 96-48.0HD.
Harvey, Donald M., 4,107,710, Cl. 354-86.000.
Scullard, Peter W.; Figueras, John; and Holtz, Carl F., 4,106,941, Cl. 96-82.000.
Turnblom, Ernest W., 4,106,934, Cl. 96-1.50R.

Eaton, Sargent Sheffield, Jr.: *See*—
Stewart, Roger Green; and Eaton, Sargent Sheffield, Jr., 4,107,556, Cl. 307-362.000.

Eaves, Ronald Spencer, to Ernest Scragg & Sons Limited. Yarn texturing machine. 4,106,274, Cl. 57-34.0HS.

Ebner, Walter B.: *See*—
Horning, Robert J.; and Ebner, Walter B., 4,107,404, Cl. 429-194.000.

Eck, Herbert; Bethe, Elmar; Schwarzbauer, Hans; Spes, Hellmuth; and Kaiser, Klaus, to Wacker-Chemie GmbH. Process for the purification of crude acetic anhydride. 4,107,002, Cl. 203-75.000.

Eckel, Alan, to Eckel Industries, Inc. Wall panel assemblies. 4,106,255, Cl. 52-582.000.

Eckel Industries, Inc.: *See*—
Eckel, Alan, 4,106,255, Cl. 52-582.000.

Ecodyne Corporation: *See*—
Weis, Frank George, 4,107,038, Cl. 210-84.000.

Economics Laboratory, Inc.: *See*—
Grismer, Thomas A., 4,106,950, Cl. 134-10.000.

Ed. Geistlich Sohne A.G. fur Chemische Industrie: *See*—
Pfirrmann, Rolf W., 4,107,305, Cl. 424-246.000.

Eda, Masato: *See*—
Yamashita, Ryuichi; Matsumoto, Hiromitsu; and Eda, Masato, 4,106,464, Cl. 123-179.00A.

Edgworth, Frederick: *See*—
Edgworth, Harry; and Edgworth, Frederick, 4,106,569, Cl. 173-1.000.

Edgworth, Harry; and Edgworth, Frederick, to Edgworth, Harry. Apparatus for applying an impact force. 4,106,569, Cl. 173-1.000.

Effland, Richard C.; Davis, Larry; and Schaub, Wolfgang, to American Hoechst Corporation. Process for preparing aminoalkylpyrrolobenzoxazalkanes. 4,107,074, Cl. 260-326.50B.

Effland, Richard C.; Davis, Larry; and Schaub, Wolfgang, to American Hoechst Corporation. Aminoalkylpyrrolobenzoxazalkanes. 4,107,187, Cl. 260-326.290.

Eftefield, Larry G., to Caterpillar Tractor Co. Weldment. 4,107,505, Cl. 219-76.140.

Egan, Richard R.: *See*—
MacDonald, Ira A.; and Egan, Richard R., 4,107,345, Cl. 426-637.000.

Egger, Helmut; and Reinshagen, Hellmuth, to Sandoz Ltd. Certain pleuromulilin ester derivatives. 4,107,164, Cl. 544-380.000.

Egloff, Markus: *See*—
Doriguzzi, Rino; Egloff, Markus; Kaufmann, Meinolph; Nehring, Jurgen; and Scheffer, Terry J., 4,106,859, Cl. 350-338.000.

Eibl, Johannes: *See*—
Langen, Hans; Ranz, Erwin; Eibl, Johannes; and Wolf, Walther, 4,106,940, Cl. 96-74.000.

Eich, Johannes: *See*—
Brachert, Heinrich; and Eich, Johannes, 4,106,960, Cl. 149-11.000.

Eikonix Corporation: *See*—
Considine, Philip S.; and Whitney, Robert E., 4,106,851, Cl. 350-87.000.

Eisai Co., Ltd.: *See*—
Kijima, Shizumasa; Igarashi, Toshiji; Yamatsu, Isao; Hamamura, Kimio; Nakajima, Yoshikage; Minami, Norio; Yamagishi, Youji; and Inai, Yuithi, 4,107,193, Cl. 260-410.000.

Eisele, Judith A.: *See*—
Bauer, Donald J.; and Eisele, Judith A., 4,107,266, Cl. 423-112.000.

Eisenberg, Richard; and Cheng, Chien-Hong, to University of Rochester. Catalyst system for catalyzing the water gas shift reaction. 4,107,076, Cl. 252-373.000.

Eitzen, Vincent Elliott: *See*—
Johnson, Clifford Carl; and Eitzen, Vincent Elliott, 4,107,467, Cl. 179-2.0DP.

Ekey, Paul E.: *See*—
Doyle, Michael A.; and Ekey, Paul E., 4,106,629, Cl. 211-71.000.

Electronic Engineering Co. of California: *See*—
Marker, Harry Rudolph, 4,107,482, Cl. 200-6.00B.

Elektroschmelzwerk Kempten GmbH: *See*—
Schwetz, Karl Alex; Vogt, George; and Lipp, Alfred, 4,107,276, Cl. 423-290.000.

Elgart, Lea Frances: *See*—
Singleton, Max C.; and Elgart, Lea Frances, 4,107,765, Cl. 362-120.000.

Elitex, Koncern textilniho strojirenstvi: *See*—
Maler, Josef; Fischer, Evzen; Losert, Miloslav; and Kopecny, Miroslav, 4,106,312, Cl. 66-50.00R.

Ellenoff, Theodore, executor: *See*—
Koehn, Wilbur R., deceased; Koehn, Elizabeth M., executrix; and Ellenoff, Theodore, executor, 4,106,506, Cl. 128-214.400.

Elliott, Curtis Homer, Jr., to W. R. Grace & Co. Copolymerized silica hydrosol bound cracking catalysts. 4,107,088, Cl. 252-455.00Z.

Ellson, Walter Gill, to C. Ellson & Co. Ltd. Submersible thermostatically controlled heaters. 4,107,514, Cl. 219-523.000.

Elphingstone, Eugene A.: *See*—
Dill, Walter R.; and Elphingstone, Eugene A., 4,107,057, Cl. 252-8.55C.

Elrod, David W.: *See*—
Marshall, Vincent P.; Elrod, David W.; Koert, James M.; Reisender, Elizabeth A.; and Wiley, Paul F., 4,106,994, Cl. 195-80.00R.

Emerson Electric Co.: *See*—
Brundage, Richard B.; Jost, Walter P., Jr.; and Burroughs, Mortimer P., 4,107,635, Cl. 336-45.000.

Emery Industries, Inc.: *See*—
Foulks, Harold C., Jr., 4,107,115, Cl. 260-23.0XA.
Sturwold, Robert J.; and Williams, Mark A., 4,107,061, Cl. 252-49.300.

EMI Limited: *See*—
Oddell, Leonard George, 4,107,563, Cl. 313-60.000.

Emmett, Robert C., Jr.; Heden, Stanley D.; and Summerhays, Roger P., to Envirotech Corporation. Treatment of iron concentrate slurry to improve filtration. 4,107,028, Cl. 209-5.000.

Emmons, David L.; Roberts, Richard E.; Pasko, Edward; and Harmon, George Lamar, to Martin Marietta Corporation. Prestored area correlation tracker. 4,106,726, Cl. 244-3.170.

Empire Foods, Inc.: *See*—
Niccolls, Paul L., 4,106,161, Cl. 17-11.000.

Emuge-Werk Richard Glimpel Fabrik fur Prazisionswerkzeuge vormals Moschkau & Glimpel: *See*—
Glimpel, Helmut, 4,106,783, Cl. 279-2.00R.

Endo, Hirohido; Inose, Fumiyuki; and Komatsu, Akio, to Hitachi, Ltd. Character generator for visual display devices. 4,107,662, Cl. 340-324.0AD.

Endo, Ichiro: *See*—
Kobayashi, Hajime; Yano, Yasuhiro; and Endo, Ichiro, 4,106,409, Cl. 101-426.000.

Endo Laboratories: *See*—
Rajagopalan, Parthasarathi; and Pachter, Irwin J., 4,107,165, Cl. 260-288.0CE.

Endo, Tadayoshi: *See*—
Hosoi, Keizo; Endo, Tadayoshi; and Kanzaki, Hidetosi, 4,107,128, Cl. 260-40.00R.

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Chang, Yew C.; Ovshinsky, Stanford R.; and Strand, David A., 4,106,939, Cl. 96-48.00R.

Engelsmann, Dieter; Hackenberg, Hubert; and Schubert, Andreas, to AGFA-Gevaert, A.G. Film sensitivity detecting filter actuating camera. 4,107,703, Cl. 354-21.000.

Engineering Systems Corporation: *See*—
Miller, Albert J., 4,106,442, Cl. 123-26.000.

English Clay Lovering Pochin & Co. Ltd.: *See*—
Webster, John David; and Jewell, Thomas John, 4,107,254, Cl. 264-270.000.

English Clays Lovering Pochin & Company, Limited: *See*—
Malden, Peter James, 4,106,949, Cl. 106-288.00B.

Ennis, Bernard P., Jr.; and Styslinger, James R., to Pullman Incorporated. Method for quenching cracked gases. 4,107,226, Cl. 260-683.00R.

Enokida, Kenji: *See—*
Isojima, Tsuyoshi; Enokida, Kenji; Nihei, Hideharu; and Ichise, Wataru, 4,107,565, Cl. 313-174.000.

Enomoto, Fuzio: *See—*
Hashimoto, Akihiko; and Enomoto, Fuzio, 4,107,705, Cl. 354-29.000.

Envirotech Corporation: *See—*
Emmett, Robert C., Jr.; Heden, Stanley D.; and Summerhays, Roger P., 4,107,028, Cl. 209-5.000.

Epicor, Inc.: *See—*
Levendusky, Jospeh A., 4,107,044, Cl. 210-266.000.

Epstein, David, to National Research Development Corporation. Hardenable compositions. 4,106,944, Cl. 106-38.200.

Equipment Industriel Normand: *See—*
Coquerel, Michel Jacques Leon, 4,106,536, Cl. 141-220.000.

Erhart, Andrew Paul: *See—*
Berger, Walter S.; Erhart, Andrew Paul; Fee, William O.; Holtgren, Darwin Lester; and Burd & Fletcher Company, 4,106,688, Cl. 229-39.00R.

Erich Grau Stanzwerk fur Elektrobleche: *See—*
Gotz, Martin, 4,106,324, Cl. 72-421.000.

Erickson, James Robert: *See—*
McGinniss, Vincent Daniel; Seidewand, Robert Joseph; and Erickson, James Robert, 4,107,013, Cl. 204-159.160.

Eriksson, Anders Gunnar: *See—*
Carlqvist, Bengt Roland; and Eriksson, Anders Gunnar, 4,107,475, Cl. 179-84.0VF.

Erixon, Berthold, to Nitro Nobel. Wires and two-part electrical coupling cover. 4,107,453, Cl. 174-87.000.

Erlandsson, Bjorn Erik, to Svenska Utvecklingsaktiebolaget. Electrical stimulator in remedy of incontinence. 4,106,511, Cl. 128-407.000.

Erndt, Edmund E., to Precision Metalsmiths, Inc. Investment material. 4,106,945, Cl. 106-38.300.

Ernest Scragg & Sons Limited: *See—*
Eaves, Ronald Spencer, 4,106,274, Cl. 57-34.0HS.

Erwin Sick Gesellschaft mit beschrankter Haftung Optik-Elektronik: *See—*
Walter, Arthur, 4,107,522, Cl. 250-221.000.

Escher Wyss GmbH: *See—*
Holik, Herbert, 4,106,211, Cl. 34-48.000.

Escher Wyss Limited: *See—*
Biondetti, Mario; and Marchioro, Ignazio, 4,106,405, Cl. 100-162.00B.
Meystre, Noel; Christ, Alfred; and Miller, Helmut, 4,106,824, Cl. 308-9.000.

Eshghy, Siavash; Hall, George D.; and Hammerle, Dennis R., to Rockwell International Corporation. Angle sensing tool for applying torque. 4,106,570, Cl. 173-12.000.

Esina, Tamara Ivanovna: *See—*
Moiseev, Vladimir Vasilievich; Kosovtsev, Vladimir Vasilievich; Kolesnikova, Galina Prokofievna; Esina, Tamara Ivanovna; Polukhin, Alexandr Nikolaevich; and Zimnukhov, Viktor Alexandrovich, 4,107,141, Cl. 528-129.000.

Eskeli, Michael. Thermodynamic compressor. 4,106,304, Cl. 62-88.000.

Esser, Gustav: *See—*
Marten, Wolfgang; Holstein, Herbert; and Esser, Gustav, 4,106,785, Cl. 279-4.000.

Etherington, Clifford: *See—*
Pardoe, John Alan; Etherington, Clifford; and Hunter, Eric, 4,106,320, Cl. 72-256.000.

Ethyl Corporation: *See—*
Dubeck, Michael; and Brackenridge, David R., 4,107,104, Cl. 521-171.000.
Nelson, Gunner E.; and Pearson, Tillmon H., 4,107,064, Cl. 252-89.00R.

Eto, Kunihiko; Niwa, Kuniyuki; and Owa, Kaoru, to Toyoda-Koki Kabushiki-Kaisha. Automatic tool change apparatus. 4,107,589, Cl. 318-602.000.

Ettingshausen, Othmar V.: *See—*
Wegner, Jurgen; Bansemir, Klaus; and Ettingshausen, Othmar V., 4,107,312, Cl. 424-263.000.

Euler, Richard W., to Bendix Corporation, The. No-lash axially movable steering column. 4,106,311, Cl. 64-23.000.

Europe-Levage Manutention (Elma): *See—*
Cavalieri, Michel; and Batreau, Francois, 4,106,753, Cl. 254-157.000.

Evans, David A., to Regent of the University of California. Useful prostaglandin intermediates. 4,107,181, Cl. 260-340.90R.

Evans, David H.; and Greenwald, Richard B., to Polaroid Corporation. Mono-N-tosylsulfimides, their preparation and their reaction products. 4,107,176, Cl. 260-327.00M.

Evans, David M., to S & C Electric Company. Switch operating mechanisms for high voltage switches. 4,107,486, Cl. 200-48.00R.

Evans, David M., to S & C Electric Company. Interrupter switch arrangement. 4,107,487, Cl. 200-48.0KB.

Evans, David M. Probe means utilized with a pair of indicators for testing the wiring connections of a fuse receptacle. 4,107,602, Cl. 324-51.000.

Evenson, Gerald N., to Upjohn Company, The. Acetal hydrazones of 2-hydrazino-3H-1,4-benzodiazepine. 4,107,159, Cl. 260-239.0BD.

Everett, Peter Kenneth, to Dextec Metallurgical Proprietary Limited. Recovery of copper from ores and concentrates. 4,107,009, Cl. 204-129.000.

Evers, William J.; Heinsohn, Howard H., Jr.; and Vock, Manfred Hugo, to International Flavors & Fragrances Inc. 3-Furyl alkyl disulfides. 4,107,184, Cl. 260-347.200.

Evers, William J.; and Heinsohn, Howard H., Jr., to International Flavors & Fragrances Inc. Process for preparing α-oxy(oxo)sulfides and ethers. 4,107,197, Cl. 260-455.00R.

Everts, Clifford Leon; Taylor, David Michael; and Delmore, Paul John, to Eastman Kodak Company. Process for improving the properties of oxysulfide phosphor materials. 4,107,070, Cl. 252-301.40S.

EWG Import-und Export-Gesellschaft mit beschrankter Haftung: *See—*
Wandel, Stephan H. A., 4,106,473, Cl. 126-25.00R.

Executive Products Corporation: *See—*
Shook, Robert L.; and Sirak, Howard D., 4,106,597, Cl. 190-42.000.

Extracorporeal Medical Systems, Inc.: *See—*
Lindsay, Edward R., Jr.; and Meginniss, Stephen Mason, III, 4,107,039, Cl. 210-90.000.

Exxon Research & Engineering Co.: *See—*
Auclair, Michel; and Le Parmentier, Louis, 4,106,287, Cl. 60-274.000.
Clarke, George A.; and Harting, Gary L., 4,107,058, Cl. 252-18.000.
Roper, Robert; and Langer, Arthur W., Jr., 4,107,238, Cl. 260-880.00R.

Faltin, Hans G. High speed insert handling mechanism and method. 4,106,762, Cl. 270-54.000.

Fanizza, Michael A.: *See—*
Cunningham, Francis V.; and Fanizza, Michael A., 4,107,567, Cl. 313-325.000.

Farber, Sheldon, to NCR Corporation. Di-vinyl color formers. 4,107,428, Cl. 542-437.000.

Farkas, Daniel F.: *See—*
Robertson, George H.; Lazar, Melvin E.; Krochta, John M.; Farkas, Daniel F.; and Bomben, John L., 4,107,340, Cl. 426-481.000.

Farnsworth, Richard G., to General Electric Company. Data communication receiver and transfer apparatus. 4,107,656, Cl. 340-151.000.

Farris, Richard C.; and Butler, William S., to Halliburton Company. Fluid truck bolster snubber. 4,106,412, Cl. 105-197.0DH.

Fasman, Anatoly Borisovich; Sokolsky, Dmitry Vladimirovich; Rutman, Grigory Iosifovich; Michurov, Jury Ivanovich; Zavorin, Viktor Anatolievich; Shalimova, Zoya Stepanovna; Timofeeva, Venera Fatykhovna; Dautov, Tulkibai Galikbarovich; Bazhakov, Daniel Kalimullovich; and Sivakov, Jury Mikhailovich. Catalyst for hydrogenolysis of N,N-dimethyl-3,5-ditert.butyl-4-hydroxybenzylamine. 4,107,090, Cl. 252-465.000.

Fastran AG: *See—*
Smith, Geoffrey Allan; and Laidlaw, Alan James, 4,106,895, Cl. 8-2.50A.

Fedchenko, Alexei Ivanovich: *See—*
Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pirogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Borisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; Shevtsov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich; Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mateshin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich; Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich; Koen, David Matveevich; Seleverstov, Vladimir Vasilievich; Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pizogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Bozisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zakharovich, 4,107,449, Cl. 13-35.000.
Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pirogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Borisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; Shevtsov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich; Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mateshin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich; Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich; Koen, David Matveevich; Seleverstov, Vladimir Vasilievich; Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pizogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Bozisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zakharovich, 4,107,449, Cl. 13-35.000.

Fee, William O.: *See—*
Berger, Walter S.; Erhart, Andrew Paul; Fee, William O.; Holtgren, Darwin Lester; and Burd & Fletcher Company, 4,106,688, Cl. 229-39.00R.

Fekete, Eugene Zoltan, to Huyck Corporation. Papermakers felts. 4,107,367, Cl. 428-234.000.

Feld, Sheldon L., to Chem-E-Watt Corporation. Therapeutic self-generating moist heat pad. 4,106,477, Cl. 126-263.000.

Fenneteau, Michel M.: *See—*
Keller, Frank R.; Kussy, Frank W.; DiMarco, Bernard; and Fenneteau, Michel M., 4,107,488, Cl. 200-50.00A.

Ferguson, Peter J., to Research Engineeering & Manufacturing, Inc. Lobular pin. 4,106,877, Cl. 403-14.000.

Fern, Thomas S. Golfer's training device. 4,106,771, Cl. 273-183.00B.

Fernando, Chulani Kumarlal; Asokan, Sangarappillai; Nagendran, Sangarappillai; Wickramasinghe, Mohanlal Randith; and Weirich, H. Paul, to Fernando, Chulani Kumarlal; Asokan, Sangarappillai; Na-

gendran, Sangarappillai; and Wickramasinghg, Mohanlal Randith. Coating apparatus. 4,106,433, Cl. 118-212.000.
Ferraris, Giuseppe: *See—*
Priola, Aldo; Cesca, Sebastiano; and Ferraris, Giuseppe, 4,107,417, Cl. 526-117.000.
Ferrell, Howard H.: *See—*
Cavanaugh, Robert J.; Coffee, Robert L.; Conley, Dell; and Ferrell, Howard H., 4,107,037, Cl. 210-82.000.
Ferrin, Charles Robert; and Manning, William Patrick, to Combustion Engineering, Inc. Process for simultaneous removal of hydrogen sulfide and water from a gas mixture without substantial removal of carbon dioxide or hydrocarbons. 4,107,270, Cl. 423-226.000.
Feutlinske, Hilmar: *See—*
Schultz, Otto; and Feutlinske, Hilmar, 4,106,792, Cl. 280-432.000.
Fey, Maurice G.: *See—*
Harvey, Francis J., II; and Fey, Maurice G., 4,106,928, Cl. 75-68.00B.
Wolf, Charles B.; and Fey, Maurice G., 4,107,445, Cl. 13-2.00P.
Fiala, George T., to J. I. Case Company. Braking system for vehicle. 4,106,818, Cl. 303-11.000.
Fiber Glass Systems, Inc.: *See—*
Michael, Vesta F., 4,106,797, Cl. 285-156.000.
Fields, Marvin C.; Oliver, David L.; and Snyder, Arthur R., to United States Steel Corporation. Gas preparation. 4,106,917, Cl. 55-31.000.
Figueras, John: *See—*
Scullard, Peter W.; Figueras, John; and Holtz, Carl F., 4,106,941, Cl. 96-82.000.
Finn, Ronald D.: *See—*
Christman, David R.; Finn, Ronald D.; and Wolf, Alfred P., 4,106,982, Cl. 176-11.000.
Fiorentino, Ermenegildo: *See—*
Ouimet, Raymond Joseph; Wojtowicz, Edward Arthur; Lund, George Edward; and Fiorentino, Ermenegildo, 4,106,636, Cl. 214-11.00R.
Firestone Tire & Rubber Company, The: *See—*
Conrad, Wendell R.; Futamura, Shingo; and Hayes, Robert A., 4,107,256, Cl. 264-310.000.
Halasa, Adel Farhan; and Hall, James Edward, 4,107,081, Cl. 252-431.00L.
Fischer, Evzen: *See—*
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Fischer, Joachim: *See—*
Knorre, Helmut; Fischer, Joachim; and Pohl, Gerhard, 4,107,274, Cl. 423-268.000.
Fischer, Walter, to WF "Rational" Anbaukuchen Walter Fischerriemsloh. Control device. 4,106,601, Cl. 192-3.00S.
Fisher, Charles Michael: *See—*
Rotramel, Richard A.; and Fisher, Charles Michael, 4,106,386, Cl. 84-256.000.
Fisher, Harry S.: *See—*
Fisher, Sidney L.; and Fisher, Harry S., 4,106,156, Cl. 16-2.000.
Fisher, Leonard; and Richardson, James E. Rotary scraper with nongouging finger array. 4,106,193, Cl. 30-172.000.
Fisher, Sidney L.; and Fisher, Harry S. Segmented guide eye. 4,106,156, Cl. 16-2.000.
Fisk, Bernard C.; and Donohue, James M., to Xerox Corporation. Programmable controller for controlling reproduction machines. 4,107,779, Cl. 364-518.000.
Fisk, James C. Grinding gauge support. 4,106,241, Cl. 51-165.740.
Fitzner, Josef; and Low, Lothar, to Akzona Incorporated. Process and device for high speed threading of yarn into a false-twisting spindle. 4,106,275, Cl. 57-77.330.
Flach, Donald O.: *See—*
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Flerov, Valery Nikolaevich: *See—*
Kucherenko, Vladimir Ilich; Flerov, Valery Nikolaevich; Korolev, Georgy Vladimirovich; Kotov, Evgeny Pavlovich; Praporov, Anatoly Mikhailovich; Batova, Galina Alexandrovna; Melikova, Gayane Leonovna; and Kolomeichuk, Alexandr Ivanovich, 4,107,011, Cl. 204-151.000.
Fletcher, George Leland; and Merrill, Stewart H., to Eastman Kodak Company. Polysulfonamides. 4,107,155, Cl. 528-373.000.
Fletcher, George Leland, Jr.; and Dedinas, Jonas, to Eastman Kodak Company. Vesicular composition, element and process utilizing a diol. 4,106,938, Cl. 96-48.0HD.
Floyd, Middleton Brawner, Jr.; Weiss, Martin Joseph; McGahren, William James; and Schaub, Robert Eugene, to American Cyanamid Company. Novel 16 hydroxy 15-deoxy-5-cis-prostenoic acids and esters. 4,107,441, Cl. 560-121.000.
Fluckiger, Friedrich, to Concast AG. Method and arrangement for removing a cooled strand from a continuous casting installation. 4,106,547, Cl. 164-82.000.
FMC Corporation: *See—*
Aterianus, John S., 4,106,262, Cl. 53-28.000.
Aterianus, John S., 4,106,265, Cl. 53-180.00R.
Bunnelle, Philip R., 4,106,575, Cl. 175-170.000.
O'Neill, Eugene T.; and Flach, Donald O., 4,107,268, Cl. 423-210.000.
Foley, Leroy Earl: *See—*
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Fong, Dodd Wing: *See—*
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Force Control Industries, Inc.: *See—*
Cory, Halsey W., 4,106,606, Cl. 192-113.00B.
Foresman, James Daniel, to Young Industries, Inc., The. Three-plane balance gyro sifter. 4,107,035, Cl. 209-309.000.
Fors, Lars Borje Staffan: *See—*
Verner, Bo Lennart; and Fors, Lars Borje Staffan, 4,107,240, Cl. 261-77.000.
Forsberg, Charles W., to Indian Head Inc. Adhesive applicator device. 4,106,154, Cl. 15-244.00R.
Forsen, Harold K.; Janes, George Sargent; and Levy, Richard H., to Jersey Nuclear-Avco Isotopes, Inc. Multiple particle type interaction isotopically selective ionization. 4,107,537, Cl. 250-423.00P.
Fosslien, Egil, to Cortex Research Corporation. Apparatus for washing contaminated laboratory containers. 4,106,155, Cl. 15-321.000.
Fost, Dennis Lynn: *See—*
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Foulks, Harold C., Jr., to Emery Industries, Inc. Soaps and ester-soaps of α-olefin derived high molecular weight acids as lubricants for thermoplastic polymers. 4,107,115, Cl. 260-23.0XA.
Fournier, Herve L. Mold for forming a hamburger patty. 4,106,162, Cl. 17-32.000.
Fournier, Lawrence E.; Jasiewicz, Theodore M.; and Milton, William M., to Sprague Electric Company. Method for making fused solid electrolyte capacitor assemblages and a fused capacitor made thereby. 4,106,184, Cl. 29-570.000.
Fox, Richard C.: *See—*
Stayner, Robert A.; Fox, Richard C.; and Jones, Thornton K., 4,106,958, Cl. 148-23.000.
Fox, Steve Allen: *See—*
Wilkenloh, Frederic Nash; Wilson, Paul Alan; and Fox, Steve Allen, 4,107,354, Cl. 427-118.000.
Fox, Theodore A.: *See—*
Scher, Victor H.; Fox, Theodore A.; and Sandford, Philip A., 4,107,509, Cl. 219-211.000.
Frank, Amalie Julianna, to Bell Telephone Laboratories, Incorporated. Scan encoding of two dimensional pictorial entities. 4,107,648, Cl. 340-146.30H.
Frankel, Neil A.: *See—*
Stearns, Richard S.; Frankel, Neil A.; and Hollstein, Elmer J., 4,107,243, Cl. 264-13.000.
Frantzreb, John G., Sr.; and Weiss, C. David, to Caterpillar Tractor Co. Inoculation article. 4,107,393, Cl. 428-558.000.
Franz, Helmut: *See—*
Sickles, James E.; Hornyak, Joseph V.; and Franz, Helmut, 4,106,697, Cl. 239-15.000.
Franz, John E., to Monsanto Company. Phosphonomethyl glycine ester anhydrides, herbicidal composition containing same and use thereof. 4,106,923, Cl. 71-86.000.
Franz, Reinhard, to WERSI-electronic GmbH & Co. Kommanditgesellschaft. Keyboard unit for electronic musical instruments. 4,106,388, Cl. 84-434.000.
Frederick Electronics Corporation: *See—*
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Freedman, Melvin H. Article of jewelry. 4,106,123, Cl. 2-152.00R.
Freeman, Alfred B. Time displays for electronic time keeping devices. 4,106,281, Cl. 58-50.00R.
Freeman, Mark P., to Dorr-Oliver Incorporated. System and method for electric dewatering of solids suspension. 4,107,026, Cl. 204-300.00R.
Freer, Edgar P. Replaceable rotating workpiece spindle with normally closed collet. 4,106,376, Cl. 82-30.000.
Freerking, Judy. Sewing accessory. 4,106,676, Cl. 223-106.000.
Freier, Edward, Jr.: *See—*
Peterson, James F.; Freier, Edward, Jr.; and Burmesch, Gerald C., 4,106,272, Cl. 56-202.000.
Freiter, Edward R., to Dow Chemical Company, The. Synthesis of alpha-diketones. 4,107,210, Cl. 260-590.00E.
Fremont, Joseph Melvin, to Du Pont de Nemours, E. I., and Company. Malachite preparation. 4,107,082, Cl. 252-431.00R.
French, Gordon B., to Occidental Oil Shale, Inc. Method of forming in situ oil shale retorts. 4,106,814, Cl. 299-2.000.
French, Joseph: *See—*
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Frensch, Heinz: *See—*
Albrecht, Konrad; Frensch, Heinz; and Hartel, Kurt, 4,107,318, Cl. 424-273.00R.
Fresard, Marcel, to Mefina S.A. Sewing machine. 4,106,419, Cl. 112-158.00A.
Fried. KRUPP Gesellschaft mit beschrankter Haftung: *See—*
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Friedman, Patty R., executor: *See—*
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tuted asymmetrical diacyl peroxides in co-initiator systems. 4,107,419, Cl. 526-228.000.

Friedrich Krollmann, Firma: *See—*
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Fruin, James C.: *See—*
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Frye, Cecil L.; and Lane, Thomas H., to Dow Corning Corporation. N-tertiarybutyl organosilylamides. 4,107,196, Cl. 260-448.20N.

Fuchs, James A.: *See—*
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Meador, Richard A.; Adams, Larry L.; Fuchs, James A.; Cox, Percy T.; and Thompson, Larry W., 4,107,598, Cl. 324-6.000.

Fuhr, Karl; Traenckner, Hans-Joachim; Rosenkranz, Hans Jurgen; Rufolph, Hans; Patheiger, Manfred; and Haus, Artur, to Bayer Aktiengesellschaft. Monomer-free resin compositions, based on unsaturated polyesters, which can be cured by UV-light. 4,107,012, Cl. 204-159.190.

Fuhrmeister, Ralph, to Furma Manufacturing Co. Pty. Ltd. Method and apparatus for riveting. 4,106,180, Cl. 29-432.100.

Fuji Photo Film Co., Ltd.: *See—*
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Fujii, Katsumi: *See—*
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Fujii, Masami. Method for installation of grounding pole. 4,106,299, Cl. 61-63.000.

Fujii, Shigeru: *See—*
Tanaka, Hiroyoshi; Koseki, Teruo; and Fujii, Shigeru, 4,107,129, Cl. 260-40.00P.

Fujii, Takara: *See—*
Akiyama, Keiichi; Kamiuchi, Junichi; Matsuda, Itsuo; and Fujii, Takara, 4,107,153, Cl. 528-322.000.

Fujii, Toru, to Olympus Optical Co., Ltd. Photographic lens system having a large aperture ratio. 4,106,854, Cl. 350-176.000.

Fujikawa, Tomio; Funakoshi, Masayasu; and Misumi, Tadanori, to Central Glass Company, Limited. Method of recovering fluorine from vapor of crude phosphoric acid solution. 4,106,918, Cl. 55-71.000.

Fujikawa, Tutomu: *See—*
Yasuike, Akio; Kataoka, Hiroshi; Fujikawa, Tutomu; and Suzuki, Naoto, 4,106,887, Cl. 425-549.000.

Fujimoto, Hideaki: *See—*
Nagano, Masashi; and Fujimoto, Hideaki, 4,106,356, Cl. 74-217.00B.

Fujita, Tsuyoshi: *See—*
Suzuki, Yasuo; Takagahara, Isamu; Fujita, Tsuyoshi; Fujii, Katsumi; and Horio, Takekazu, 4,107,014, Cl. 204-180.00R.

Fujitsu Limited: *See—*
Furutani, Nagahisa; Takahara, Kazuo; Doi, Yoshikazu; and Yokouchi, Haruo, 4,107,621, Cl. 330-296.000.
Kawada, Toyoshi; Andoh, Shizuo; and Yoshikawa, Kazuo, 4,107,578, Cl. 315-169.0TV.
Kurihara, Yasuo, 4,107,649, Cl. 340-146.1AG.
Tanahashi, Jun'ichi; and Kanie, Takashi, 4,107,652, Cl. 340-146.1AL.

Fujiyoshi, Kanji; Fukuda, Minoru; Mizumura, Yutaka; Sono, Junji; and Naito, Iori, to Toyo Boseki Kabushiki Kaisha. Powder coating composition comprising a mixture of a polyester and plural silicone compounds. 4,107,148, Cl. 528-273.000.

Fukatsu, Shunzo: *See—*
Umezawa, Hamao; Umezawa, Sumio; Maeda, Kenji; Tsuchiya, Osamu; Kondo, Shinichi; and Fukatsu, Shunzo, 4,107,424, Cl. 536-10.000.

Fukuda, Minoru: *See—*
Fujiyoshi, Kanji; Fukuda, Minoru; Mizumura, Yutaka; Sono, Junji; and Naito, Iori, 4,107,148, Cl. 528-273.000.

Fukuda, Tamotsu: *See—*
Hattori, Tadashi; Takata, Akira; Fukuda, Tamotsu; and Nakase, Takamichi, 4,106,451, Cl. 123-119.0EC.

Fukuzawa, Tadashi: *See—*
Tanimizu, Shinkichi; Suzuki, Teruki; and Fukuzawa, Tadashi, 4,107,571, Cl. 313-486.000.

Fukuzuka, Toshio; Shimogori, Kazutoshi; and Satoh, Hiroshi, to Kobe Steel, Ltd. Electrolytic cell with electrodes arranged as a hexagon. 4,107,024, Cl. 204-275.000.

Fulk, Ronald Dean: *See—*
Weigand, Rex Olen; McMillen, Kenneth Ray; Fulk, Ronald Dean; Prichard, Daniel Ray; and Kountz, Jack Merriel, 4,106,270, Cl. 56-98.000.

Fulmer, John Arthur; and Walker, David Judson, to Babcock & Wilcox Company, The. Air deflector. 4,106,890, Cl. 431-184.000.

Funakoshi, Masayasu: *See—*
Fujikawa, Tomio; Funakoshi, Masayasu; and Misumi, Tadanori, 4,106,918, Cl. 55-71.000.

Funatsu, Chuhei; and Hirata, Toshikiyo, to Toyo Tsushinki Kabushiki Jaka Toyo Communication Equipment Co. Ltd. Collision avoidance system for aircrafts. 4,107,674, Cl. 343-6.50R.

Fung, Anthony K. L.: *See—*
Biel, John Hans; Bariana, Dilbagh S.; and Fung, Anthony K. L., 4,107,172, Cl. 260-308.00D.

Funk, Gary L.: *See—*
Tuckett, William F.; Funk, Gary L.; and Smith, Dexter E., 4,106,916, Cl. 55-21.000.

Furma Manufacturing Co. Pty. Ltd.: *See—*
Fuhrmeister, Ralph, 4,106,180, Cl. 29-432.100.

Furtado, John: *See—*
Martin, Walter J.; and Furtado, John, 4,107,685, Cl. 343-100.0SA.

Furuhashi, Keizo: *See—*
Suzuki, Shuzo; Furuhashi, Keizo; and Taoka, Akira, 4,106,986, Cl. 195-28.00R.

Furutani, Nagahisa; Takahara, Kazuo; Doi, Yoshikazu; and Yokouchi, Haruo, to Fujitsu Limited. Microwave signal amplifier. 4,107,621, Cl. 330-296.000.

Furuto, Takashi, to Kabushiki Kaisha Komatsu Seisakusho. Stop mechanism for shearing apparatus. 4,106,147, Cl. 10-25.000.

Futamura, Shingo: *See—*
Conrad, Wendell R.; Futamura, Shingo; and Hayes, Robert A., 4,107,256, Cl. 264-310.000.

G.A.O. Gesellschaft fur Automation und Organisation mbH: *See—*
Schirrmeister, Harry; von Aschwege, Gerd; Helmrich, Harald; and Bernardi, Herbert, 4,106,767, Cl. 271-188.000.

G. D. Searle & Co.: *See—*
Renbarger, Jerry J.; and Yonan, Peter K., 4,107,205, Cl. 260-558.00A.

G.K.N. Group Services Limited: *See—*
Bunton, John Darrah; and Marsh, David John, 4,106,331, Cl. 73-61.10R.

Gaccione, Carmine. Amalgamator. 4,106,199, Cl. 32-40.00A.

Gagnon, David L.: *See—*
Pratt, Frederick P.; and Gagnon, David L., 4,107,283, Cl. 424-1.000.

Galetto, Louis Valentine; and Jensen, Donald Frederick, to International Business Machines Corporation. Ink jet printer apparatus and method of operation. 4,107,698, Cl. 346-75.000.

Galinke, Joachim: *See—*
Gruber, Werner; Galinke, Joachim; and Wegemund, Bernd, 4,107,386, Cl. 428-412.000.

Gallegos, George L.: *See—*
Lynch, John H.; and Gallegos, George L., 4,107,464, Cl. 179-1.00B.

Galli, Guido: *See—*
Chiou, Charles; Galli, Guido; Loeffler, Karl H.; and Lorenz, Max R., 4,106,976, Cl. 156-644.000.

Gallo, Joseph Sebato. Artificial stem assembly for a short stem cut flower. 4,106,234, Cl. 47-55.000.

Gallo-Torres, Hugo; Hamilton, James Guthrie; Rosen, Perry; and Sullivan, Ann Clare, to Hoffmann-La Roche Inc. Pregnanes. 4,107,188, Cl. 260-397.100.

Gambaretto, Gian Paolo; and Gottardi, Vittorio, to Industrie Zignago S. Margherita S.p.A. Method for the surface treatment of glass by leaching. 4,107,388, Cl. 428-428.000.

Ganellin, Charon Robin: *See—*
Durant, Graham John; Ganellin, Charon Robin; and Young, Rodney Christopher, 4,107,319, Cl. 424-273.00R.

Garber, Murray, to American Cyanamid Company. Method of preparing dl 6-phenyl-2,3,5,6-tetrahydroimidazo-[2,1-b]thiazole and acid addition salts thereof. 4,107,170, Cl. 260-306.70T.

Garcia Corporation, The: *See—*
Catignani, Robert T., 4,106,718, Cl. 242-84.20R.

Gardner, Eric Richard, to Avon Rubber Company Limited. Fabric having an elastomer coat on face and method of producing same. 4,107,369, Cl. 428-246.000.

Gardner, John W.; Grgurich, William A.; and Niles, Albert B., to Caterpillar Tractor Co. Fuel injection nozzle tip with low volume tapered sac. 4,106,702, Cl. 239-533.300.

Gardon, John L.: *See—*
Karoly, Gabriel; and Gardon, John L., 4,107,353, Cl. 427-54.000.

Garlock Inc.: *See—*
Benjamin, Martin E.; and Bainard, Dean R., 4,106,781, Cl. 277-82.000.

Garratt, Philip Melvin; Foley, Leroy Earl; Godbarsen, Robert; and Barrett, David M., to General Electric Company. X-ray body scanner using encoder for generating system controlling timing pulse train. 4,107,531, Cl. 250-360.000.

Garrison, Donald W.; and Hartman, James T., to Time Computer, Inc. Wristwatch setting system. 4,106,277, Cl. 58-4.00A.

Garskamp, Arnoldus, to U.S. Philips Corporation. Receiver including an automatic tuning correction suppression circuit coupled to the tuning member. 4,107,615, Cl. 325-420.000.

Gasser, George E. Bumper edge member for chairs. 4,106,739, Cl. 248-345.100.

Gaston County Dyeing Machine Company: *See—*
Bousquet, Donald G.; Camp, Jesse G., Jr.; Hopkins, Mortimer Gilbert; and Jagt, Leonard J., 4,106,899, Cl. 8-101.000.

Gatlin, Alvin O.; Tausch, Gilbert H.; and Watkins, Fred E., to Camco, Incorporated. Sidepocket mandrel. 4,106,563, Cl. 166-117.500.

Gaumann, Andreas F.; and Dancilovic-Matulas, Visnja, to Gesellschaft zur Forderung der Forschung an der Eidgenossischen Technischen Hochschule. Process for the recovery of lead from scrapped lead batteries. 4,107,007, Cl. 204-116.000.

Gauriat, Gilles; Vernezy, Jacques; and Barigot, Jean-Claude, to Com-

pagnie Industrielle des Telecommunications Cit-Alcatel S.A. Digital train processing device. 4,107,468, Cl. 179-15.0BY.
Gausepohl, Hermann: *See*—
Wurmb, Rolf; Seydl, Wolfgang; Penzien, Klaus; Gausepohl, Hermann; and Sterzel, Hans-Josef, 4,107,231, Cl. 260-873.000.
Gebhardt, Roland; and Gersin, Robert P., to Kayser-Roth Corporation. Device for displaying and storing articles. 4,106,668, Cl. 221-131.000.
Geer, R. M.: *See*—
Oliphant, Howard G., 4,106,236, Cl. 49-141.000.
General Dynamics Corporation: *See*—
Glasfeld, Rolf D.; and Morrill, Jan G., 4,106,423, Cl. 114-74.00A.
Schuler, Alan L.; and Post, David L., 4,106,424, Cl. 114-74.00A.
General Electric: *See*—
Haaf, William Robert; and Reinhard, Donald Lewis, 4,107,232, Cl. 260-876.00R.
General Electric Company: *See*—
Anderson, Thomas E.; Ibsen, Ole N.; and Walker, Loren H., 4,107,771, Cl. 363-58.000.
Baker, Fred E., 4,107,766, Cl. 362-226.000.
Carter, Robert A., 4,107,553, Cl. 307-293.000.
Farnsworth, Richard G., 4,107,656, Cl. 340-151.000.
Garratt, Philip Melvin; Foley, Leroy Earl; Godbarsen, Robert; and Barrett, David M., 4,107,531, Cl. 250-360.000.
Hart, Howard R., Jr., 4,107,525, Cl. 250-303.000.
Hildebrandt, Herbert J.; and Perkins, Donald W., 4,106,462, Cl. 123-148.00E.
Houtman, Jack A., 4,107,583, Cl. 318-221.00D.
Jencks, Charles L.; and Castonguay, Roger N., 4,107,497, Cl. 200-144.00R.
Lauer, Richard E., 4,106,185, Cl. 29-596.000.
Mark, Victor; and Hedges, Charles Vernon, 4,107,443, Cl. 568-750.000.
McMannis, William Thomas, 4,107,600, Cl. 324-78.00R.
Moore, James E.; and Schroeter, Siegfried H., 4,107,391, Cl. 428-483.000.
Owen, William S., Jr.; and Lovejoy, George C., 4,106,377, Cl. 83-4.000.
Pury, Thomas; Assa, Menachem; and Wagner, Howard R., 4,107,590, Cl. 318-628.000.
Quinn, Clayton B., 4,107,442, Cl. 568-726.000.
St. Peters, Richard L., 4,107,536, Cl. 250-423.00P.
Schuster, Robert M.; and Luria, Norman G., 4,107,456, Cl. 174-151.000.
Serrano, Juan de J., 4,106,341, Cl. 73-362.0AR.
Stone, Russell L., Jr., 4,107,629, Cl. 331-116.00R.
Williams, Frank J., III; and Donahue, Paul E., 4,107,147, Cl. 528-172.000.
General Foods Limited: *See*—
Beston, George H.; and Kirk, Donald W., 4,107,344, Cl. 426-625.000.
Shrimpton, Brian Clifford, 4,107,339, Cl. 426-387.000.
General Motors Corporation: *See*—
Dent, Richard G.; and Stack, Gary F., 4,106,659, Cl. 220-67.000.
Mair, Alex C., 4,106,803, Cl. 293-62.000.
West, Gene A., 4,106,447, Cl. 123-117.00R.
Winchell, Frank J., 4,106,605, Cl. 192-105.0CD.
Wright, Carl J., 4,106,517, Cl. 134-58.00D.
General Signal Corporation: *See*—
Mikituk, Murray M., 4,107,791, Cl. 366-205.000.
Geosource Inc.: *See*—
Wunsch, Walter G., 4,106,524, Cl. 137-625.440.
Gergen, William P.; and Davison, Sol, to Shell Oil Company. Multicomponent polyolefin-block copolymer-polymer blends. 4,107,130, Cl. 260-40.00R.
Gergen, William P.; and Davison, Sol, to Shell Oil Company. Multicomponent polyurethane-block copolymer-polymer blends. 4,107,131, Cl. 260-40.0TN.
Gerrard Industries Limited: *See*—
Sutehall, Donald, 4,106,403, Cl. 100-25.000.
Gersin, Robert P.: *See*—
Gebhardt, Roland; and Gersin, Robert P., 4,106,668, Cl. 221-131.000.
Gerwick, Ben C., Jr., to Kajima Corporation. Building system for seismic-active areas. 4,106,301, Cl. 61-86.000.
Gesellschaft zur Forderung der Forschung an der Eidgenossischen Technischen Hochschule: *See*—
Gaumann, Andreas F.; and Dancilovic-Matulas, Visnja, 4,107,007, Cl. 204-116.000.
Gevas, James Constantine. Egg shell breaker. 4,106,402, Cl. 99-571.000.
Giannini, Sebastian Louis. Reflective ignition timing process. 4,106,461, Cl. 123-148.00E.
Giannini, Umberto; Cassata, Antonio; Longi, Paolo; and Mazzocchi, Romano, to Montedison S.p.A. Process for the stereoregular polymerization of alpha olefins. 4,107,413, Cl. 526-114.000.
Giannini, Umberto; Cassata, Antonio; Longi, Paolo; and Mazzocchi, Romano, to Montecatini Edison S.p.A. Process for the stereoregular polymerization of alpha olefins. 4,107,414, Cl. 526-114.000.
Giannini, Umberto; Cassata, Antonio; Longi, Paolo; and Mazzocchi, Romano, to Montecatini Edison S.p.A. Process for the stereospecific polymerization of alpha-olefins. 4,107,415, Cl. 526-114.000.
Giannini, Umberto; Albizzati, Enrico; and Parodi, Sandro, to Montedison S.p.A. Components of catalysts for use in polymerizing and catalysts prepared therefrom. 4,107,416, Cl. 526-114.000.
Gibrich, Jack. Suspensible ornamental display. 4,106,228, Cl. 40-605.000.
Gibson, David Vincent; and Leary, Bruce, to Dulux Australia Ltd. Autoxidisable composition. 4,107,113, Cl. 260-18.0PF.
Gibson, Myron R., to Caterpillar Tractor Co. Seal lubrication in a rotary engine. 4,106,169, Cl. 29-156.40R.
Giesen, Heinz; Hibbel, Josef; Jansen, Willi; and Speth, Sebastian, to Ruhrchemie Aktiengesellschaft. Separation of carbon black by liquid hydrocarbons. 4,107,036, Cl. 210-21.000.
Gilain, Jacques: *See*—
Mulders, Julien; and Gilain, Jacques, 4,107,411, Cl. 526-75.000.
Gilb, Tyrell T., to Simpson Manufacturing Co., Inc. Composite truss bearing clip. 4,106,257, Cl. 52-693.000.
Gilbreath, Cecil R.; and Womble, Jimmie L., to Texas Instruments Incorporated. Advanced array transform processor with fixed/floating point formats. 4,107,773, Cl. 364-200.000.
Gilger, William Francis: *See*—
Montgomery, Murray Mathews; Gilger, William Francis; and Steiner, William Winfield, 4,106,639, Cl. 214-14.000.
Gillen, John E.; and Odom, Gary C. Boat mounted game blind. 4,106,145, Cl. 9-5.000.
Gillespie, David M. Fluidically supported and fluidically driven turntable. 4,106,776, Cl. 274-39.00R.
Gillette Company, The: *See*—
Buras, Edmund Maurice, Jr.; and Harper, Allan Carl, 4,106,190, Cl. 30-43.700.
Gipson, Robert M.: *See*—
McEntire, Edward E.; and Gipson, Robert M., 4,107,096, Cl. 252-546.000.
Girling Limited: *See*—
Brearley, Malcolm, 4,106,821, Cl. 303-92.000.
Girodin, Marius G. Reciprocating engines, pumps or compressors. 4,106,354, Cl. 74-60.000.
Gittelis, Meir, to Nahshol Electronics Ltd. Mounting construction for motion sensor. 4,107,545, Cl. 307-121.000.
Glasfeld, Rolf D.; and Morrill, Jan G., to General Dynamics Corporation. Weather covers for tankers. 4,106,423, Cl. 114-74.00A.
Glaxo Laboratories Limited: *See*—
Clark, John Colin; Kennedy, James; Long, Alan Gibson; and Weir, Niall Galbraith, 4,107,431, Cl. 544-16.000.
Gleason, John Gerald, to SmithKline Corporation. Intermediates for preparing substituted phenylglycylcephalosporins. 4,107,440, Cl. 560-17.000.
Glickstein, Myer; Tuomy, Justin M.; and Shwert, Marianne J., to United States of America, Army. Freeze-dried mix for spoonable salad dressing and method therefor. 4,107,335, Cl. 426-96.000.
Glimpel, Helmut, to Emuge-Werk Richard Glimpel Fabrik fur Prazisionswerkzeuge vormals Moschkau & Glimpel. Clamping device for accurately centering a work-piece or a tool. 4,106,783, Cl. 279-2.00R.
Globe-Union Inc.: *See*—
Dougherty, Thomas John; Hennen, Roy Erving; and Pierson, John Ronald, 4,107,402, Cl. 429-120.000.
Glover, John Stuart: *See*—
Charlton, John Cecil; Glover, John Stuart; and Shepherd, Bryan Peter, 4,106,907, Cl. 23-230.300.
Godbarsen, Robert: *See*—
Garratt, Philip Melvin; Foley, Leroy Earl; Godbarsen, Robert; and Barrett, David M., 4,107,531, Cl. 250-360.000.
Goff, Clifford E.: *See*—
Moon, William T., Jr.; Rogers, Arden D.; Goff, Clifford E.; and Bannon, Harry B., 4,107,492, Cl. 200-81.90M.
Goldman, Leon; Lin, Yang-i; and Marsico, Joseph William, Jr., to American Cyanamid Company. Novel benzylideneaminoguanidines. 4,107,326, Cl. 424-304.000.
Goldschmidt, Rolf: *See*—
Altenbokum, Karlheinz; Goldschmidt, Rolf; Hansgen, Klaus; Hiersig, Heinz M.; and Szynka, Peter, 4,106,366, Cl. 74-801.000.
Goloff, Alexander, to Caterpillar Tractor Co. Engine valve with recessed seat and annular groove. 4,106,466, Cl. 123-188.00S.
Golota, John H., to Westinghouse Electric Corp. Disconnect switch and drive mechanism therefor. 4,107,498, Cl. 200-148.00B.
Golz, Hans-Joachim: *See*—
Lindenberg, Hans-Georg; and Golz, Hans-Joachim, 4,107,398, Cl. 429-88.000.
Goodbary, Edgar R., to Goodbary Engineering Co. Bottom dump door linkage apparatus and dump body partition means. 4,106,813, Cl. 298-35.00M.
Goodbary Engineering Co.: *See*—
Goodbary, Edgar R., 4,106,813, Cl. 298-35.00M.
Goodson, Forrest R.; Shipman, William H.; and McCartney, Joseph F., to United States of America, Navy. Super high energy density battery. 4,107,401, Cl. 429-101.000.
Goodyear Tire & Rubber Company, The: *See*—
Lee, Michael Wayne, 4,106,965, Cl. 156-123.00R.
Gordon, Bruce E.: *See*—
Hutcheon, Robert Stewart; and Gordon, Bruce E., 4,107,692, Cl. 343-120.000.
Gordon, David J.; and Ziemelis, Maris J., to Dow Corning Corporation. Radiation-curable organopolysiloxane coating composition comprising mercaptoalkyl and silacyclopentenyl radicals, method of coating and article therefrom. 4,107,390, Cl. 428-447.000.
Gordon, Robert Thomas. Cancer treatment method. 4,106,488, Cl. 128-1.00R.
Gordon, Roy Gerald. Process for treating cellulose. 4,107,426, Cl. 536-56.000.
Goroshko, Oleg Nikolaevich: *See*—
Bondar, Petr Grigorievich; Goroshko, Oleg Nikolaevich; Suschaya, Larisa Emmanuilovna; Lavrova, Valentina Vasilievna;

Leleka, Valentina Emmanuilovna; and Iiko, Eduard Grigorievich, 4,107,089, Cl. 252-465.000.

Goth, Stephen: *See—*
Plamondon, Joseph E.; Wilber, William R.; and Goth, Stephen, 4,107,120, Cl. 260-29.6RB.

Goto, Nobuo: *See—*
Murai, Sadao; Goto, Nobuo; Tanioka, Katsuhiko; Matsunaga, Masaaki; and Isayama, Riyoiti, 4,107,249, Cl. 264-68.000.

Gottardi, Vittorio: *See—*
Gambaretto, Gian Paolo; and Gottardi, Vittorio, 4,107,388, Cl. 428-428.000.

Gotz, Martin, to Erich Grau Stanzwerk fur Elektrobleche. Feeding mechanism. 4,106,324, Cl. 72-421.000.

Goulay, Jean: *See—*
Vairel, Edmond G.; Goulay, Jean; and Choay, Jean, 4,106,992, Cl. 195-66.00B.

Gould Inc.: *See—*
Keller, Frank R.; Kussy, Frank W.; DiMarco, Bernard; and Fenneteau, Michel M., 4,107,488, Cl. 200-50.00A.
Kiewit, David A., 4,107,626, Cl. 331-65.000.
Salzer, Erwin, 4,106,843, Cl. 339-232.000.

Grabner, Roy W.: *See—*
Morse, Lewis D.; Boroshok, Melvin J.; and Grabner, Roy W., 4,107,072, Cl. 252-316.000.

Graboyes, Harold, to SmithKline Corporation. Method for preparing ticrynafen. 4,107,179, Cl. 260-332.20A.

Grace, Henry C.: *See—*
Petree, Harris E.; Nabors, James B., Jr.; and Grace, Henry C., 4,106,927, Cl. 71-121.000.

Graf, Erhard; and Wiedmer, Jean-Pierre, to Oscilloquartz Sa. Parallel analog and digital control loops for phase locking precision oscillator to reference oscillator. 4,107,623, Cl. 331-1.00A.

Graham, William Eric: *See—*
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Graser, Reinhold; Hofmeister, Heinz Karl; and Metzger, Adolf, to Hoechst Aktiengesellschaft. Process for the preparation of amidosulfonic acid. 4,107,279, Cl. 423-389.000.

Graul, Juergen; and Murrmann, Helmut, to Siemens Aktiengesellschaft. Inverse planar transistor. 4,107,719, Cl. 357-15.000.

Gravert, William H., to Marine Moisture Control Company, Inc. Quick acting coupling. 4,106,541, Cl. 151-48.000.

Gray, Frederick W., to Colgate-Palmolive Company. Activated peroxy compound bleaching compositions and bleaching detergent compositions. 4,107,065, Cl. 252-99.000.

Gray, John M. Hypodermic syringe projectile. 4,106,770, Cl. 273-106.50D.

Greatbatch, Robert Johnson. Coupling dolly. 4,106,791, Cl. 280-423.00A.

Green, Charles Emmons, to Brunswick Corporation. Snagproof helmut camouflage cover. 4,106,124, Cl. 2-187.000.

Greenawalt, Eddie Lee, to Dow Chemical Company, The. Method of forming, filling, and sealing scrim reinforced plastic bags. 4,106,261, Cl. 53-27.000.

Greenberg, Michael J., to Quaker Oats Company, The. Flavoring with 1,7-dihydroxy-2,5-dithia-tricyclo[7.3.0.0^{3,7}]dodecane. 4,107,342, Cl. 426-535.000.

Greenwald, A. Seth; Porritt, Derek S.; and Matejczyk, Mary-Blair. Endoprosthetic bone joint. 4,106,128, Cl. 3-1.910.

Greenwald, Richard B.: *See—*
Evans, David H.; and Greenwald, Richard B., 4,107,176, Cl. 260-327.00M.

Greger, Paul, to Rollei-Werke Franke & Heidecke. Film feed mechanism for cameras. 4,107,713, Cl. 354-209.000.

Gregory, Jocelyn Margaret: *See—*
Baklien, Asbjorn; Serban, Alexandru; and Gregory, Jocelyn Margaret, 4,106,924, Cl. 71-106.000.

Grgurich, William A.: *See—*
Gardner, John W.; Grgurich, William A.; and Niles, Albert B., 4,106,702, Cl. 239-533.300.

Griffith, Carl D., to Sperry Rand Corporation. Fail safe force feel system. 4,106,728, Cl. 244-83.00D.

Grigoriev, Eduard Maximovich: *See—*
Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pirogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Borisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; Shevtsov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich; Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mateshin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich; Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich; Koen, David Matveevich; Seleverstov, Vladimir Vasilievich; Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pizogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Bozisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zakharovich, 4,107,449, Cl. 13-35.000.
Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pirogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Borisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; Shevtsov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich; Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mateshin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich; Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich; Koen, David Matveevich; Seleverstov, Vladimir Vasilievich; Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pizogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Bozisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zakharovich, 4,107,449, Cl. 13-35.000.

Grill, Benjamin: *See—*
Sturman, Oded E.; and Grill, Benjamin, 4,107,546, Cl. 307-141.000.

Grimsdale, Richard Lawrence; Willis, Philip John; and Hadjiaslanis, Aris, to National Research Development Corporation. Display apparatus. 4,107,780, Cl. 364-521.000.

Grismer, Thomas A., to Economics Laboratory, Inc. Tank wagon cleaning method. 4,106,950, Cl. 134-10.000.

Grivsky, Eugene Michael, to Burroughs Wellcome Co. Biologically active amides. 4,107,320, Cl. 424-274.000.

Grohoski, Raymond J., to Timex Corporation. Battery hatch cover. 4,107,400, Cl. 429-98.000.

Grootjans, Jacques F. J.: *See—*
Debande, Guy F. S.; Cahen, Raymond N. M.; and Grootjans, Jacques F. J., 4,107,225, Cl. 260-683.900.

Gross, Fritz A.; Pease, William M.; Meade, John E.; and Vickers, Harry, to Raytheon Company. Radar system with improved brightness and resolution. 4,107,673, Cl. 343-5.0DP.

Gross, Laurence Herbert: *See—*
Angell, Richard Gordon, Jr.; Gross, Laurence Herbert; and Berger, Sidney Ethan, 4,107,258, Cl. 264-328.000.

Grotkopp, Detlef; Wedemeyer, Karlfried; Behrenz, Wolfgang; and Hammann, Ingeborg, to Bayer Aktiengesellschaft. Indan-5-yl-N-methylcarbamic acid esters. 4,107,324, Cl. 424-300.000.

Grubbs, Michael R.: *See—*
Paterson, Malcolm M.; Grubbs, Michael R.; Cambourelis, Peter J.; and Schrimper, Vernon L., 4,107,034, Cl. 209-135.000.

Gruber, Ludwig, to John GmbH. Marine propulsion unit with protected screw. 4,106,425, Cl. 115-42.000.

Gruber, Werner; Galinke, Joachim; and Wegemund, Bernd, to Henkel Kommanditgesellschaft auf Aktien. Anaerobically hardening adhesives and sealants based on (meth)acrylic esters containing polycarbonates terminated by (meth)acrylic ester groups. 4,107,386, Cl. 428-412.000.

Gruenberg, Elliot L. Communications transponder. 4,107,609, Cl. 325-14.000.

Grunza, Gene; and Herscher, Marvin B., to Threshold Technology, Inc. Apparatus for recognizing words from among continuous speech. 4,107,460, Cl. 179-1.0SD.

GTE Sylvania Incorporated: *See—*
Benasutti, John Eugene, 4,106,842, Cl. 339-221.00R.
Chleboun, Thomas P., 4,107,660, Cl. 340-566.000.
Jayne, Max Leroy; Orbanic, Robert Stephen; and Lapraik, Scott Jack, 4,106,838, Cl. 339-99.00R.

Gubela, Hans: *See—*
Diedershagen, Bruno; and Gubela, Hans, 4,106,879, Cl. 404-10.000.

Gubela Strassenausrustungs-GmbH: *See—*
Diedershagen, Bruno; and Gubela, Hans, 4,106,879, Cl. 404-10.000.

Gubitose, Nicholas Francis; and James, Robert Arthur, to RCA Corporation. Machine for straightening the wire leads of a device. 4,106,532, Cl. 140-147.000.

Gudenau, Heinrich: *See—*
Wenzel, Werner; Gudenau, Heinrich; and Bernt, Joachim, 4,106,996, Cl. 201-6.000.

Gudenau, Heinrich Wilhelm: *See—*
Wenzel, Werner; Gudenau, Heinrich; and Bernt, Joachim, 4,106,996, Cl. 201-6.000.

Guerbet S.A.: *See—*
Tilly, Guy; Hardouin, Michel Jean-Charles; and Lautrou, Jean, 4,107,286, Cl. 424-5.000.

Guerra, Luis A. Device for prolonged intravascular infusion. 4,106,491, Cl. 128-2.00F.

Guetzl, Horst: *See—*
Distler, Georg; and Guetzl, Horst, 4,107,500, Cl. 200-308.000.

Guidosh, Edward F., to Westinghouse Electric Corp. No-load tap changer for three-phase transformers. 4,107,637, Cl. 336-150.000.

Guiles, Chester L.: *See—*
Kutnyak, Thomas A.; Dunn, George T.; and Guiles, Chester L., 4,106,968, Cl. 156-189.000.

Gulf Oil Canada Limited: *See—*
Lorenz, Gordon Ronald, 4,107,029, Cl. 208-11.0LE.

Gulf & Western Industries, Inc.: *See—*
Seipp, William H., 4,107,785, Cl. 364-900.000.

Gulf & Western Manufacturing Company: *See—*
Horowitz, Carl; Mangaraj, Duryodham; and Iorio, Joseph A., 4,106,955, Cl. 148-6.000.
Horowitz, Carl; Dichter, Michael; Duryodhan, Mangara J.; and Ioria, Joseph A., 4,107,228, Cl. 260-836.000.

Gulish, William P., Jr., to Libbey-Owens-Ford Company. Glass breaking out apparatus. 4,106,683, Cl. 225-103.000.

Gunderson, Philip D.: *See—*
Lai, Chi Sun; and Gunderson, Philip D., 4,106,440, Cl. 123-117.00R.

Gunther, William H., Jr., to Thor Dahl, Inc. Apparatus for applying chemicals to envelopes. 4,106,432, Cl. 118-211.000.

Gurdak, Felix J.; and Cook, Francis W., Jr., to Litton Industrial Products, Inc. Variable feed high-production precision machine. 4,106,375, Cl. 82-21.00B.

Gustav Wagner Maschinenfabrik: *See*—
Kaiser, Gerhard, 4,106,378, Cl. 83-74.000.
Gutmann, Walter: *See*—
Pfeifer, Josef; Paulus, Rudolf; Gutmann, Walter; and Resch, Michael, 4,107,687, Cl. 346-107.00R.
Gymer, Geoffrey E.: *See*—
Cox, David A.; Gymer, Geoffrey E.; and Shroot, Braham, 4,107,314, Cl. 424-263.000.
H. B. Fuller Company: *See*—
Clausen, Victor H.; and Brenno, Lester C., 4,107,372, Cl. 428-256.000.
H. F. Hanscom & Company, Inc.: *See*—
Hanscom, Harris F., 4,106,264, Cl. 53-124.00D.
H. H. Robertson Company: *See*—
Davis, Bernard Harpley, 4,106,535, Cl. 141-88.000.
H. L. Blachford Limited: *See*—
Blachford, John, 4,106,932, Cl. 75-252.000.
Haaf, William Robert; and Reinhard, Donald Lewis, to General Electric. Flame retardant, non-dripping compositions of polyphenylene ether and acrylonitrile-butadiene-styrene. 4,107,232, Cl. 260-876.00R.
Haag, Thomas H.; Brendley, William H., Jr.; and Martorano, Richard, to Rohm and Haas Company. Method of coating utilizing rheologically modified metal decorating and aqueous coating composition comprising latex and aminoplast. 4,106,421, Cl. 113-120.00A.
Haas, Lothar; Brautigam, Rolf; and Weckenmann, Albert, to Robert Bosch GmbH. Proximity switch and circuit system. 4,107,555, Cl. 307-308.000.
Haase, Edward Emil, Jr.: *See*—
Spilman, Raymond; Haase, Edward Emil, Jr.; Kruger, Kurt John; Budnick, Donald Barry; and Lasorso, Vincent John, Jr., 4,106,490, Cl. 128-2.00F.
Habiger, Cyril W., to Caterpillar Tractor Co. Speed and load responsive underspeed actuator for hydrostatic transmissions. 4,106,292, Cl. 60-447.000.
Hackenberg, Hubert: *See*—
Engelsmann, Dieter; Hackenberg, Hubert; and Schubert, Andreas, 4,107,703, Cl. 354-21.000.
Hadary, Joseph. Toothbrush. 4,106,152, Cl. 15-172.000.
Haddon, Frank M. Windsplitter truck stabilizer. 4,106,806, Cl. 296-23.0MC.
Hadjiaslanis, Aris: *See*—
Grimsdale, Richard Lawrence; Willis, Philip John; and Hadjiaslanis, Aris, 4,107,780, Cl. 364-521.000.
Haennerle AG: *See*—
Haenni, Eduard J.; and Zbornik, Vaclav, 4,106,323, Cl. 72-389.000.
Haenni, Eduard J.; and Zbornik, Vaclav, to Haennerle AG. Bending tool. 4,106,323, Cl. 72-389.000.
Haessly, Walter F.: *See*—
Toma, Charles A.; and Haessly, Walter F., 4,107,491, Cl. 200-61.420.
Haga, Toshikatsu; and Hori, Saburo, to Kureha Kagaku Kogyo Kabushiki Kaisha. Apparatus for heat treatment using downwardly swirling hot gas flow. 4,106,892, Cl. 432-58.000.
Haikawa, Shozo: *See*—
Akiyoshi, Toshio; Onishi, Tsutomu; and Haikawa, Shozo, 4,106,371, Cl. 81-57.140.
Hajduk, Thomas M., to TRW Inc. Transfer terminal with library phrase memory. 4,107,457, Cl. 178-17.500.
Hakim, Carlos A.: *See*—
Hakim, Salomon; and Hakim, Carlos A., 4,106,510, Cl. 128-350.00V.
Hakim Company Limited: *See*—
Hakim, Salomon; and Hakim, Carlos A., 4,106,510, Cl. 128-350.00V.
Hakim, Mohammad Javid, to Westinghouse Canada Limited. Chemical vapor deposition. 4,107,352, Cl. 427-50.000.
Hakim, Salomon; and Hakim, Carlos A., to Hakim Company Limited. Servo valve. 4,106,510, Cl. 128-350.00V.
Hakli, Reijo Sakari, to Lannen Tehtaat OY. Plant-setting machine. 4,106,415, Cl. 111-3.000.
Halasa, Adel Farhan; and Hall, James Edward, to Firestone Tire & Rubber Company, The. Catalyst system and process for polymerization of conjugated dienes therewith. 4,107,081, Cl. 252-431.00L.
Hall, George D.: *See*—
Eshghy, Siavash; Hall, George D.; and Hammerle, Dennis R., 4,106,570, Cl. 173-12.000.
Hall, James Edward: *See*—
Halasa, Adel Farhan; and Hall, James Edward, 4,107,081, Cl. 252-431.00L.
Hall, John B.: *See*—
Sprecker, Mark A.; Vock, Manfred Hugo; Schmitt, Frederick Louis; Hall, John B.; and Sanders, James Milton, 4,107,093, Cl. 252-522.000.
Hallerback, Stig Lennart, to SKF Industrial Trading and Development Company B.V. Electric machine. 4,107,560, Cl. 310-60.00R.
Halliburton Company: *See*—
Dill, Walter R.; and Elphingstone, Eugene A., 4,107,057, Cl. 252-8.55C.
Dodson, James C.; and Labyer, Harold S., 4,106,393, Cl. 92-168.000.
Farris, Richard C.; and Butler, William S., 4,106,412, Cl. 105-197.0DH.
Hallin, Peter R.: *See*—
Bancroft, Joseph C.; and Hallin, Peter R., 4,106,239, Cl. 49-449.000.
Halm Instrument Co., Inc.: *See*—
Lyon, Floyd A.; and Harrison, Henry, 4,106,480, Cl. 126-270.000.
Halter Marine Services, Inc.: *See*—
Marsden, John, 4,106,637, Cl. 214-13.000.
Hamada, Masahiro: *See*—
Ohsugi, Katsuhisa; Takeuchi, Daizo; Hamada, Masahiro; and Kano, Tamotsu, 4,106,988, Cl. 195-49.000.
Hamamura, Kimio: *See*—
Kijima, Shizumasa; Igarashi, Toshiji; Yamatsu, Isao; Hamamura, Kimio; Nakajima, Yoshikage; Minami, Norio; Yamagishi, Youji; and Inai, Yuithi, 4,107,193, Cl. 260-410.000.
Hamburger Hochbahn Aktiengesellschaft: *See*—
Schultz, Otto; and Feutlinske, Hilmar, 4,106,792, Cl. 280-432.000.
Hamid, Michael A., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Grading agricultural products with a microwave antenna. 4,106,340, Cl. 73-355.00R.
Hamilton, James Guthrie: *See*—
Gallo-Torres, Hugo; Hamilton, James Guthrie; Rosen, Perry; and Sullivan, Ann Clare, 4,107,188, Cl. 260-397.100.
Hamilton, Stephen P.: *See*—
Barrett, Johnny M.; and Hamilton, Stephen P., 4,107,781, Cl. 364-700.000.
Hammann, Ingeborg: *See*—
Grotkopp, Detlef; Wedemeyer, Karlfried; Behrenz, Wolfgang; and Hammann, Ingeborg, 4,107,324, Cl. 424-300.000.
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Hammann, Ingeborg; and Behrenz, Wolfgang, 4,107,301, Cl. 424-200.000.
Hammerle, Dennis R.: *See*—
Eshghy, Siavash; Hall, George D.; and Hammerle, Dennis R., 4,106,570, Cl. 173-12.000.
Hammond, Donald J.: *See*—
Lin, Kingso C.; and Hammond, Donald J., 4,107,117, Cl. 260-28.50B.
Hamon, Jean-Francois: *See*—
Hercelin, Bernard; and Hamon, Jean-Francois, 4,107,333, Cl. 424-365.000.
Hanaway, Roger D.: *See*—
Nelson, John P.; and Hanaway, Roger D., 4,106,649, Cl. 214-522.000.
Hanes Corporation: *See*—
King, J. Frank, 4,106,260, Cl. 53-21.0FW.
Haney, Jerry D., to American Optical Corporation. Initialization circuit. 4,106,498, Cl. 128-2.05A.
Hanscom, Harris F., to H. F. Hanscom & Company, Inc. Apparatus for compressing and holding a banked package of flexible material during fastening. 4,106,264, Cl. 53-124.00D.
Hansen, David R., to Shell Oil Company. Block copolymer blend with certain acrylics. 4,107,233, Cl. 260-876.00B.
Hansen, Gunnar Lyshoj; and Sturlason, Leif Viggo, to Danfoss A/S. Distributing valve on a hydraulic rotary piston engine. 4,106,883, Cl. 418-61.00B.
Hansen, Lars J., to Toledo Pickling & Steel Service, Inc. Process for treating waste hydrochloric acid. 4,107,267, Cl. 423-138.000.
Hansen, Owen P. Tape measure. 4,106,201, Cl. 33-75.00R.
Hansgen, Klaus: *See*—
Altenbokum, Karlheinz; Goldschmidt, Rolf; Hansgen, Klaus; Hiersig, Heinz M.; and Szynka, Peter, 4,106,366, Cl. 74-801.000.
Hanson, Gordon L.: *See*—
Heyn, Fred M.; Yin, Ching-Feng; Hanson, Gordon L.; and Schreck, Robert C., 4,106,556, Cl. 165-81.000.
Hanson, Raymond A. Bidirectional rotary excavator. 4,106,226, Cl. 37-190.000.
Haralambou, Larry A. Combination hedge trimmer and clippings collector. 4,106,191, Cl. 30-132.000.
Hardouin, Michel Jean-Charles: *See*—
Tilly, Guy; Hardouin, Michel Jean-Charles; and Lautrou, Jean, 4,107,286, Cl. 424-5.000.
Harita, Yoshiyuki: *See*—
Ikeda, Hiroharu; Aotani, Seiji; and Harita, Yoshiyuki, 4,106,943, Cl. 96-115.00R.
Harman, Wayne L.: *See*—
Totten, George F.; and Harman, Wayne L., 4,106,457, Cl. 123-133.000.
Harmon, George Lamar: *See*—
Emmons, David L.; Roberts, Richard E.; Pasko, Edward; and Harmon, George Lamar, 4,106,726, Cl. 244-3.170.
Harold, Billy. Vehicle transport trailer. 4,106,805, Cl. 296-1.00A.
Harper, Allan Carl: *See*—
Buras, Edmund Maurice, Jr.; and Harper, Allan Carl, 4,106,190, Cl. 30-43.700.
Harper, Kenneth B., to Motorola, Inc. Cassette record player-recorder. 4,107,749, Cl. 360-105.000.
Harris, Bernhard: *See*—
Butzow, Neil W.; and Harris, Bernhard, 4,107,381, Cl. 428-365.000.
Harris, Martin H.: *See*—
Borcher, Charles A.; Porter, William R.; and Harris, Martin H., 4,106,411, Cl. 102-67.000.
Harris, William D.: *See*—
Best, Robert H.; and Harris, William D., 4,107,756, Cl. 361-231.000.
Harrison, Henry: *See*—
Lyon, Floyd A.; and Harrison, Henry, 4,106,480, Cl. 126-270.000.
Harry M. Miller Attractions Pty. Limited: *See*—
Steed, Trevor Ashton, 4,106,194, Cl. 30-228.000.
Harsha, Robert W., to Pacific Fireplace Furnishings, Inc. Door for fireplace screen. 4,106,476, Cl. 126-140.000.
Hart, Howard R., Jr., to General Electric Company. Flowmeter device and method for determining velocity of a fluid. 4,107,525, Cl. 250-303.000.

Hart, James E., to Westinghouse Air Brake Company. Emergency portion for a brake control valve. 4,106,819, Cl. 303-38.000.
Hartbauer, Ellsworth A.; Weis, Rudolf R.; and Kemp, Horace N., to Crown Zellerbach Corporation. Sheet material dispensing device. 4,106,684, Cl. 226-91.000.
Hartel, Kurt: *See*—
Albrecht, Konrad; Frensch, Heinz; and Hartel, Kurt, 4,107,318, Cl. 424-273.00R.
Harting, Gary L.: *See*—
Clarke, George A.; and Harting, Gary L., 4,107,058, Cl. 252-18.000.
Hartman, James T.: *See*—
Garrison, Donald W.; and Hartman, James T., 4,106,277, Cl. 58-4.00A.
Haruna, Tohru: *See*—
Minagawa, Motonobu; Nakahara, Yutaka; and Haruna, Tohru, 4,107,136, Cl. 260-45.95C.
Harvey, Donald M., to Eastman Kodak Company. Photographic apparatus for use with self-processing film units. 4,107,710, Cl. 354-86.000.
Harvey, Francis J., II; and Fey, Maurice G., to Westinghouse Electric Corp. Chlorination process for producing aluminum. 4,106,928, Cl. 75-68.00B.
Harvey, Gary Lee: *See*—
Cummings, Gary Eugene; Harvey, Gary Lee; and Dean, Charles Wallace, 4,106,250, Cl. 52-394.000.
Hashimoto, Akihiko; and Enomoto, Fuzio, to Olympus Optical Co., Ltd. Bladed shutter. 4,107,705, Cl. 354-29.000.
Hashizume, Nobuo: *See*—
Kataoka, Shoei; Hashizume, Nobuo; and Kodera, Hiroshi, 4,107,718, Cl. 357-3.000.
Hassemer, Georg: *See*—
Kessler, Erich; Hassemer, Georg; and Weber, Paul, 4,106,244, Cl. 52-63.000.
Hattori, Katsuhiko: *See*—
Yamada, Masatoshi; Oshima, Yujiro; Hattori, Katsuhiko; and Suzuki, Hideyuki, 4,106,446, Cl. 123-90.130.
Hattori, Tadashi; Takata, Akira; Fukuda, Tamotsu; and Nakase, Takamichi, to Nippon Soken, Inc.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Air-fuel ratio adjusting system for internal combustion engines. 4,106,451, Cl. 123-119.0EC.
Haug, Albert, to Societe d'Etudes de Machines Thermiques-S.E.M.T. Fluid-tight pipe coupling arrangement. 4,106,798, Cl. 285-226.000.
Haus, Artur: *See*—
Fuhr, Karl; Traenckner, Hans-Joachim; Rosenkranz, Hans Jurgen; Rufolph, Hans; Patheiger, Manfred; and Haus, Artur, 4,107,012, Cl. 204-159.190.
Hauschild, Ulrich; and Roetger, Heinrich, to Kali-Chemie. Alkaline decomposition process for producing calcined phosphate fertilizer. 4,106,922, Cl. 71-42.000.
Hausmann, Erwin, to August Bilstein, Firma. Hydropneumatic single tube shock absorber, in particular steering shock absorber. 4,106,596, Cl. 188-314.000.
Haverland, Joseph G. Reel assembly for kite lines and the like. 4,106,719, Cl. 242-96.000.
Hawley, George Thomas; and Young, Lawrence Henry, to Bell Telephone Laboratories, Incorporated. Electronic tone ringer. 4,107,495, Cl. 179-84.00T.
Hayashi, Yasuhisa, to White Sewing Machine Company. One-step buttonhole mechanism for sewing machine. 4,106,418, Cl. 112-158.00B.
Hayashi, Yoshihiro: *See*—
Inukai, Mitsuo; and Hayashi, Yoshihiro, 4,106,722, Cl. 242-107.700.
Hayashi, Yoshimasa: *See*—
Nakajima, Yasuo; and Hayashi, Yoshimasa, 4,106,471, Cl. 123-198.00F.
Haydock, David Bryan; Mulholland, Thomas Patrick Cunningham; and Thorp, Jeffrey Meyrick, to Imperial Chemical Industries Limited. Fluorinated compounds as therapeutics. 4,107,329, Cl. 424-317.000.
Hayduk, Harry Nicholas, to Koppers Company, Inc. Coke pushing device. 4,106,642, Cl. 214-18.00R.
Hayes, Marvin F., Jr.: *See*—
Hayes, Marvin F., Sr.; and Hayes, Marvin F., Jr., 4,106,579, Cl. 177-137.000.
Hayes, Marvin F., Sr.; and Hayes, Marvin F., Jr. Load analyzer for automotive vehicle. 4,106,579, Cl. 177-137.000.
Hayes, Robert A.: *See*—
Conrad, Wendell R.; Futamura, Shingo; and Hayes, Robert A., 4,107,256, Cl. 264-310.000.
Haytayan, Harry M. Nail assemblies. 4,106,618, Cl. 206-343.000.
Haytayan, Harry M., to Pneutek, Inc. Nail clips. 4,106,619, Cl. 206-346.000.
Hazemeijer B.V.: *See*—
Clason, Jan C., 4,107,496, Cl. 200-144.00B.
Heden, Stanley D.: *See*—
Emmett, Robert C., Jr.; Heden, Stanley D.; and Summerhays, Roger P., 4,107,028, Cl. 209-5.000.
Hedge, Ramesh Subayya, to Ventron Corporation. Borohydride exchange resins and their uses as reducing agents and in preparation of volatile metal hydrides. 4,107,099, Cl. 521-30.000.
Hedges, Charles Vernon: *See*—
Mark, Victor; and Hedges, Charles Vernon, 4,107,443, Cl. 568-750.000.
Heftman, George: *See*—
Moore, William Thomas; and Heftman, George, 4,106,845, Cl. 350-6.600.
Hegge, Theodorus Cornelis Jozef Maria: *See*—
van der Veen, Jan; and Hegge, Theodorus Cornelis Jozef Maria, 4,107,189, Cl. 260-404.000.
Heijting, Hendrik Gerrit, to Thomassen en Drijver-Verblifa N.V. Container having a mouth, such container provided with a metal cap and metal cap for closing such container. 4,106,655, Cl. 214-341.000.
Heikes, James E.: *See*—
Sprague, Peter W.; and Heikes, James E., 4,107,175, Cl. 260-327.00M.
Heil, Oskar. Electro-acoustic transducer. 4,107,479, Cl. 179-116.000.
Heiman, Frederic P., to Mars, Incorporated. Coin apparatus having multiple coin-diverting gates. 4,106,610, Cl. 194-97.00R.
Heimburger, Norbert: *See*—
Karges, Hermann Erich; and Heimburger, Norbert, 4,106,990, Cl. 195-63.000.
Heinrich, Hans Juergen; Rademacher, Karl August; Strohn, Helmut; and Kramer, Friedhelm. Filter press with spray washing means. 4,107,042, Cl. 210-225.000.
Heinsohn, Howard H., Jr.: *See*—
Evers, William J.; Heinsohn, Howard H., Jr.; and Vock, Manfred Hugo, 4,107,184, Cl. 260-347.200.
Evers, William J.; and Heinsohn, Howard H., Jr., 4,107,197, Cl. 260-455.00R.
Heiser, Richard S., to Westinghouse Electric Corp. Time delayed relay sequencer and alarm reset for a gas turbine local maintenance controller. 4,107,542, Cl. 290-40.00R.
Heiwa Electronic Industrial Co.: *See*—
Zenitani, Toshio, 4,107,538, Cl. 250-480.000.
Heller, Rudolf: *See*—
Schneider, Urs; and Heller, Rudolf, 4,106,219, Cl. 35-17.000.
Helm, James L.: *See*—
Tutor, Gerald L.; Fruin, James C.; and Helm, James L., 4,107,338, Cl. 426-293.000.
Helmrich, Harald: *See*—
Schirrmeister, Harry; von Aschwege, Gerd; Helmrich, Harald; and Bernardi, Herbert, 4,106,767, Cl. 271-188.000.
Helmso, Bennie E.; Holden, Thomas E.; and Liljenwall, Edward T., to Hewlett-Packard Company. Wrist wearable electronic device with an engagedly stored selected tool. 4,106,677, Cl. 224-5.00A.
Helsley, Grover C.: *See*—
McFadden, Arthur R.; and Helsley, Grover C., 4,107,322, Cl. 424-278.000.
Hendal, Willem P.: *See*—
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Herr, John A.; and Jaffe, Wolfgang, to Singer Company, The. Hall generator position sensing device. 4,107,591, Cl. 318-663.000.
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High, Steve. Motor vehicle suspension system. 4,106,789, Cl. 280-793.000.

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Hirsch, John L., to Curt G. Joa, Inc. Flying splice apparatus. 4,106,974, Cl. 156-504.000.

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Schulz, Lothar; and Arpe, Hans-Jurgen, 4,107,263, Cl. 423-481.000.

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Howatt, George Frederick, to New England Envelope Manufacturing. Gum applicator. 4,106,431, Cl. 118-203.000.
Howell, Alleyne C., Jr. Electrification rail and joint construction. 4,106,599, Cl. 191-27.000.
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Hurd, Deane E. Mathematical teaching aid. 4,106,220, Cl. 35-31.00R.

Hutcheon, Robert Stewart; and Gordon, Bruce E., to Raytheon Company. Radio frequency signal direction finding system. 4,107,692, Cl. 343-120.000.

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Fekete, Eugene Zoltan, 4,107,367, Cl. 428-234.000.

Hvidsten, Jan Hagbert, to Coal Industry (Patents) Limited. Pulse counting apparatus for measuring mechanical movement of a machine such as a mining machine. 4,107,516, Cl. 235-92.0FP.

Hyde, Glenn F.; and Alban, Thomas W., to Koppers Company, Inc. Ceramic coated piston rings. 4,106,782, Cl. 277-235.00A.

Hyde, Michael B., to Caterpillar Tractor Co. Tapping strip retainer. 4,106,808, Cl. 296-35.00R.

Ibrahim, Fayez F. Open well type refrigerated display case with reverse flow of air bands. 4,106,305, Cl. 62-89.000.

Ibsen, Ole N.: *See—*
Anderson, Thomas E.; Ibsen, Ole N.; and Walker, Loren H., 4,107,771, Cl. 363-58.000.

Ichise, Wataru: *See—*
Isojima, Tsuyoshi; Enokida, Kenji; Nihei, Hideharu; and Ichise, Wataru, 4,107,565, Cl. 313-174.000.

ICI Australia Limited: *See—*
Baklien, Asbjorn; Serban, Alexandru; and Gregory, Jocelyn Margaret, 4,106,924, Cl. 71-106.000.

Ideal Toy Corporation: *See—*
Carella, Vincent; and Nielsen, Edwin A., 4,106,695, Cl. 238-10.00F.

Igarashi, Toshiji: *See—*
Kijima, Shizumasa; Igarashi, Toshiji; Yamatsu, Isao; Hamamura, Kimio; Nakajima, Yoshikage; Minami, Norio; Yamagishi, Youji; and Inai, Yuithi, 4,107,193, Cl. 260-410.000.

Ihara Chemical Company Co., Ltd.: *See—*
Takahashi, Akio; Saito, Hirokichi; and Oyaizu, Yoshijiro, 4,107,151, Cl. 528-54.000.

Ikeda, Hiroharu; Aotani, Seiji; and Harita, Yoshiyuki, to Japan Synthetic Rubber Co., Ltd. Photosensitive cross-linkable azide containing polymeric composition. 4,106,943, Cl. 96-115.00R.

Ikeda, Hisao: *See—*
Murata, Atsuo; Tsuchiya, Shuji; Suzuki, Hideo; and Ikeda, Hisao, 4,107,219, Cl. 568-875.000.

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Ilines, Laurence James, to C.A. Pemberton & Co. Limited. Device for removing meat hangers from meat. 4,106,174, Cl. 29-239.000.

Ilko, Eduard Grigorievich: *See—*
Bondar, Petr Grigorievich; Goroshko, Oleg Nikolaevich; Suschaya, Larisa Emmanuilovna; Lavrova, Valentina Vasilievna; Leleka, Valentina Emmanuilovna; and Ilko, Eduard Grigorievich, 4,107,089, Cl. 252-465.000.

Illinois Tool Works Inc.: *See—*
Anderson, Bruce W., 4,106,317, Cl. 70-388.000.

Image Transform, Inc.: *See—*
Lowry, John D.; and Holland, Kenneth F., 4,107,736, Cl. 358-36.000.

Imahashi, Jinichi: *See—*
Mori, Toshikatsu; Takeuchi, Masato; Hitomi, Otane; Uno, Shigeo; Imahashi, Jinichi; and Nakajima, Fumito, 4,107,272, Cl. 423-239.000.

Imamura, Haruo: *See—*
Tsuzuku, Akihiko; Tanazawa, Masao; Kaminishi, Masashi; and Imamura, Haruo, 4,106,817, Cl. 302-17.000.

IMC Chemical Group, Inc.: *See—*
Jurisch, Louis A., 4,107,171, Cl. 260-307.0FA.

Imperial Chemical Industries Limited: *See—*
Haydock, David Bryan; Mulholland, Thomas Patrick Cunningham; and Thorp, Jeffrey Meyrick, 4,107,329, Cl. 424-317.000.
Kennington, Rowland; and Woolhouse, Robin Andrew, 4,107,053, Cl. 252-2.000.

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Lorenz, Gordon Ronald, 4,107,029, Cl. 208-11.0LE.

Inai, Yuithi: *See—*
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Inata, Hiroo; Morinaga, Tsuto; Kuratsuji, Takatoshi; Urasaki, Takanori; and Kawase, Shoji, to Teijin Limited; and Teyin Limited. Aromatic polyester carbonate and method for producing the same. 4,107,143, Cl. 528-176.000.

Indal Product Limited: *See—*
Bonello, Alfred, 4,106,238, Cl. 49-382.000.

Indian Head Inc.: *See—*
Forsberg, Charles W., 4,106,154, Cl. 15-244.00R.

Industrie Pirelli S.p.A.: *See—*
Calori, Giovanni, 4,106,888, Cl. 425-577.000.

Industrie Zignago S. Margherita S.p.A: *See—*
Gambaretto, Gian Paolo; and Gottardi, Vittorio, 4,107,388, Cl. 428-428.000.

Ingersoll-Rand Company: *See—*
Black, Arthur L., 4,106,780, Cl. 277-81.00P.
Rice, Edwin Eugene; and Vliet, Walter Carl, 4,106,176, Cl. 29-407.000.

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Kevorkian, Victor; and Cumings, Francis J., 4,106,997, Cl. 201-32.000.

Ingraham, Glen E. Thermoplastic resinous protective coating on a metallic substrate. 4,107,370, Cl. 428-247.000.

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Inoue, Yuuji, to Concast AG. Roller assembly in the guide path of a continuous casting machine for beam blanks. 4,106,551, Cl. 164-448.000.

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Wilson, Jeffrey V.; Tucker, Leroy W.; Briggs, William D.; and Inouye, Alan T., 4,106,833, Cl. 339-29.00B.

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Dawans, Francois, 4,107,134, Cl. 260-42.170.

Inter Control Hermann Kohler Elektrik GmbH & Co. KG: *See—*
Hollweck, Walter, 4,107,638, Cl. 307-131.000.

International Business Machines Corporation: *See—*
Berkenblit, Melvin; Chan, See Ark; Reisman, Arnold; and Zirinsky, Stanley, 4,106,975, Cl. 156-628.000.
Chamberlain, Savvas Georgiou, 4,107,722, Cl. 357-30.000.
Chiou, Charles; Galli, Guido; Loeffler, Karl H.; and Lorenz, Max R., 4,106,976, Cl. 156-644.000.
Dreiza, John Edward; and Riley, Joseph Vincent, 4,106,873, Cl. 400-470.000.
Galetto, Louis Valentine; and Jensen, Douald Frederick, 4,107,698, Cl. 346-75.000.
Jacquart, Christian A.; Leighton, Howard N.; and Wilfinger, Raymond J., 4,107,550, Cl. 307-241.000.
Kovac, Zlata; and Sambucetti, Carlos Juan, 4,107,063, Cl. 252-62.520.
Lynott, John Joseph, 4,106,667, Cl. 221-1.000.
Yao, Ying Luh, 4,107,554, Cl. 307-306.000.

International Flavors & Fragrances Inc.: *See—*
Evers, William J.; Heinsohn, Howard H., Jr.; and Vock, Manfred Hugo, 4,107,184, Cl. 260-347.200.
Evers, William J.; and Heinsohn, Howard H., Jr., 4,107,197, Cl. 260-455.00R.
Light, Kenneth K.; Vock, Manfred Hugo; Shuster, Edward J.; and Schmitt, Frederick Louis, 4,107,094, Cl. 252-522.000.
Schreiber, William L.; Siano, James N.; and Shuster, Edward J., 4,107,066, Cl. 252-132.000.
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Schreiber, William L.; and Pittet, Alan O., 4,107,217, Cl. 260-615.00A.
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International Harvester Company: *See—*
Carey, Thomas A.; and Ridge, George W., 4,106,271, Cl. 56-119.000.

International Lead Zinc Research Organization, Inc.: *See—*
Ward, John Joseph Bernard; and Barnes, Clive, 4,107,004, Cl. 204-51.000.

International Med-Electronics, Inc.: *See—*
Zenitani, Toshio, 4,107,538, Cl. 250-480.000.

International Standard Electric Corporation: *See—*
Barton, Paul, 4,107,686, Cl. 343-106.00R.

International Telephone & Telegraph Corp.: *See—*
Reed, Joseph, 4,107,471, Cl. 179-15.0FD.

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Ioria, Joseph A.: *See—*
Horowitz, Carl; Dichter, Michael; Duryodhan, Mangara J.; and Ioria, Joseph A., 4,107,228, Cl. 260-836.000.

Iorio, Joseph A.: *See—*
Horowitz, Carl; Mangaraj, Duryodham; and Iorio, Joseph A., 4,106,955, Cl. 148-6.000.

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Sultanian, Ishkhan V.; and Irani, Joseph H., 4,107,284, Cl. 424-1.000.

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Nakajima, Takashi; Irie, Tomoyuki; and Kusumoto, Keiichi, 4,106,430, Cl. 118-64.000.

Ironfield, Richard, to Raytheon Company. Microwave oven control system. 4,107,501, Cl. 219-10.55B.

Irvin Industries Inc.: *See—*
Petersen, Carl Mogens, III, 4,107,484, Cl. 200-42.00T.

Irwin, Robert M. Elevated loading platform. 4,106,150, Cl. 14-71.300.

Isaka, Yukio Inagi,: *See—*
Masaki, Katsumi; and Isaka, Yukio Inagi,, 4,107,786, Cl. 364-900.000.

Isayama, Riyoiti: *See*—
Murai, Sadao; Goto, Nobuo; Tanioka, Katsuhiko; Matsunaga, Masaaki; and Isayama, Riyoiti, 4,107,249, Cl. 264-68.000.
Ishibashi, Keijiro, to Sankyo Company Limited. Compositions for cleaning teeth and oral cavity. 4,107,291, Cl. 424-48.000.
Ishida, Yotsuo; and Kuwahara, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha; and Tokyo Electric Power Co., Inc., The. Discharge gap device. 4,107,754, Cl. 361-120.000.
Ishihara, Kazuo: *See*—
Okada, Yutaka; Sasaguri, Kyoji; and Ishihara, Kazuo, 4,106,998, Cl. 201-39.000.
Ishihara Sangyo Kaisha Ltd.: *See*—
Rohr, Otto; Pissiotas, Georg; and Bohner, Beat, 4,106,925, Cl. 71-108.000.
Ishikawa, Takashi. Granulated fire retardant materials. 4,107,376, Cl. 428-306.000.
Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See*—
Tsuchida, Yutaka, 4,106,550, Cl. 164-448.000.
Ishino, Hiroshi, to Oki Electric Industry Co., Ltd. Logic circuit for a semiconductor integrated circuit. 4,107,547, Cl. 307-203.000.
Isojima, Tsuyoshi; Enokida, Kenji; Nihei, Hideharu; and Ichise, Wataru, to Tokyo Shibaura Electric Co., Ltd. Mercury emitting structure. 4,107,565, Cl. 313-174.000.
Isovolta Osterreichische Isolierstoffwerke Aktiengesellschaft: *See*—
Szabolcs, Otto; and Schuller, Hans, 4,107,409, Cl. 526-65.000.
Itek Corporation: *See*—
Sprague, Robert A.; and MacGovern, Alan J., 4,107,701, Cl. 346-108.000.
Itoh, Norio: *See*—
Shimada, Satoshi; and Itoh, Norio, 4,106,866, Cl. 353-29.000.
Itoh, Yasuo: *See*—
Takahashi, Nobuaki; Nishikawa, Kazunori; Iwasaki, Yoshiki; Satoh, Masaaki; Ohba, Katsuhiro; Nakamura, Shinji; Sawada, Tatsuo; Ohsaki, Nobuhide; Itoh, Yasuo; Suda, Nobuaki; Okabe, Yasuhisa; and Ozaki, Hideaki, 4,107,478, Cl. 179-100.4ST.
Ivey, John Saxon, to Borg-Warner Corporation. Transmission control system. 4,106,368, Cl. 74-866.000.
Iwai, Yuzuru: *See*—
Omura, Satoshi; Iwai, Yuzuru; and Hirano, Atsushi, 4,107,297, Cl. 424-122.000.
Iwasaki, Hajime; and Tomita, Yasuo, to Mitsuboshi Sangyo Co., Ltd. Bulky asphalt-impregnated sheet having different properties on both surfaces. 4,107,375, Cl. 428-291.000.
Iwasaki, Masaatsu: *See*—
Higuchi, Shigetaka; Iwasaki, Masaatsu; and Kimura, Shigeo, 4,107,385, Cl. 428-412.000.
Iwasaki, Yoshiki: *See*—
Takahashi, Nobuaki; Nishikawa, Kazunori; Iwasaki, Yoshiki; Satoh, Masaaki; Ohba, Katsuhiro; Nakamura, Shinji; Sawada, Tatsuo; Ohsaki, Nobuhide; Itoh, Yasuo; Suda, Nobuaki; Okabe, Yasuhisa; and Ozaki, Hideaki, 4,107,478, Cl. 179-100.4ST.
Iwata, Nobuo: *See*—
Suzuki, Takami; and Iwata, Nobuo, 4,106,611, Cl. 400-144.200.
Iwata, Shigehisa, to Nippon Electric Co., Ltd. Circuit for digitally computing exposure control information. 4,107,704, Cl. 354-23.00D.
Izumi, Sachio; and Kotani, Tamotsu, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Method and apparatus for welding using fillet-wire. 4,107,508, Cl. 219-137.700.
Izumikawa, Akira, to Victor Company of Japan, Limited. Cassette holder capable of rotation through a larger angle of inclination. 4,107,753, Cl. 360-137.000.
J. I. Case Company: *See*—
Fiala, George T., 4,106,818, Cl. 303-11.000.
Lundy, Richard W., 4,106,631, Cl. 212-144.000.
Siems, Gerald Eugene, 4,106,592, Cl. 184-25.000.
J. & P. Coats Limited: *See*—
Aitken, John; and Graham, William Eric, 4,106,902, Cl. 8-181.000.
J. Uriach & Cia. S.A.: *See*—
Agusti, Agustin, 4,107,161, Cl. 260-239.55D.
Jack, Clyde A.; and Dargan, Evander E. Assembly miter joint. 4,106,254, Cl. 52-574.000.
Jackson, George, to British Steel Corporation. Hover furnaces. 4,106,757, Cl. 266-103.000.
Jacobs, Norman A., to Teletype Corporation. Step motor velocity control. 4,107,594, Cl. 318-685.000.
Jacobsson, Kurt Arne Gunnar, to Aktiebolaget IRO. Thread feeder for textile machines. 4,106,713, Cl. 242-47.010.
Jacquart, Christian A.; Leighton, Howard N.; and Wilfinger, Raymond J., to International Business Machines Corporation. Bucket brigade circuits. 4,107,550, Cl. 307-241.000.
Jacquet, Bernard; Papantoniou, Christos; Dufaure, Pierre; and Mahieu, Claude, to L'Oreal. Anti-solar polymers, method of making the same and cosmetic compositions containing the same. 4,107,290, Cl. 424-47.000.
Jaffe, Wolfgang: *See*—
Herr, John A.; and Jaffe, Wolfgang, 4,107,591, Cl. 318-663.000.
Jager, Horst: *See*—
Petruck, Gerd-Michael; Klauke, Erich; and Jager, Horst, 4,107,186, Cl. 260-351.000.
Jagt, Leonard J.: *See*—
Bousquet, Donald G.; Camp, Jesse G., Jr.; Hopkins, Mortimer Gilbert; and Jagt, Leonard J., 4,106,899, Cl. 8-101.000.
Jakobsen, William, to Lourdes Industries, Inc. Apparatus for pneumatically communicating with a pressurized cable. 4,107,454, Cl. 174-135.000.
Jalil, Asjed A.; and Rich, C. Allen, to Morgan Construction Company. Vane-type nozzle assembly. 4,106,519, Cl. 134-122.00R.
James, Edward Anthony; and Kuznetzoff, Philip, to RCA Corporation. Method of depositing or repairing a patterned metal layer on a substrate. 4,107,351, Cl. 427-43.000.
James, Joseph W. Apparatus for indicating the angle of a drafting parallel. 4,106,202, Cl. 33-80.000.
James, Robert Arthur: *See*—
Gubitose, Nicholas Francis; and James, Robert Arthur, 4,106,532, Cl. 140-147.000.
Janes, George Sargent: *See*—
Forsen, Harold K.; Janes, George Sargent; and Levy, Richard H., 4,107,537, Cl. 250-423.00P.
Janish, Rudolph G. Means for quick attachment of implement to a tractor. 4,106,645, Cl. 214-145.00A.
Jankowski, Albert J.: *See*—
Lewis, Donald J.; and Jankowski, Albert J., 4,107,645, Cl. 340-52.00E.
Jansen, Willi: *See*—
Giesen, Heinz; Hibbel, Josef; Jansen, Willi; and Speth, Sebastian, 4,107,036, Cl. 210-21.000.
Jansky, John: *See*—
Stofko, John, 4,107,379, Cl. 428-326.000.
Jansson, Gunnar, to Allmanna Svenska Elektriska Aktiebolaget. Method of and composition for manufacturing an object of cross-linked polymer. 4,107,245, Cl. 264-40.100.
Jansson, K. Sigvard: *See*—
Sigfridsson, F.S. Meinrad; and Jansson, K. Sigvard, 4,106,538, Cl. 144-309.00R.
Janzen, Harlo W. Wire reeling apparatus. 4,106,714, Cl. 242-54.00R.
Japan Air Lines, Co., Ltd.: *See*—
Mihirogi, Kiyoshi, 4,106,600, Cl. 191-59.100.
Japan Synthetic Rubber Co., Ltd.: *See*—
Ikeda, Hiroharu; Aotani, Seiji; and Harita, Yoshiyuki, 4,106,943, Cl. 96-115.00R.
Jarvis, Charles Richard: *See*—
Smith, Brian Roger; Jarvis, Charles Richard; Payne, Stephen Martin; Potts, Robert John; and Wallis, Frank, 4,106,187, Cl. 29-625.000.
Jasiewicz, Theodore M.: *See*—
Fournier, Lawrence E.; Jasiewicz, Theodore M.; and Milton, William M., 4,106,184, Cl. 29-570.000.
Jasper, Ezekiel: *See*—
Henlis, Lawrence Philip, 4,106,454, Cl. 123-122.00F.
Jasper, Harvey: *See*—
Henlis, Lawrence Philip, 4,106,454, Cl. 123-122.00F.
Jatsch, Werner: *See*—
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Jautelat, Manfred: *See*—
Dahm, Manfred; and Jautelat, Manfred, 4,107,102, Cl. 521-163.000.
Jayne, Max Leroy; Orbanic, Robert Stephen; and Lapraik, Scott Jack, to GTE Sylvania Inc. Stackable flat cable connector and contact therefor. 4,106,838, Cl. 339-99.00R.
Jegelka, Johann Friedrich. Production of articles of foamed plastics material. 4,106,884, Cl. 425-345.000.
Jellinek, Ernest, to RCA Corporation. System for automatic vehicle location. 4,107,689, Cl. 343-112.0TC.
Jenaer Glaswerk Schott & Gen.: *See*—
Ritze, Willi, 4,106,946, Cl. 106-52.000.
Jencks, Charles L.; and Castonguay, Roger N., to General Electric Company. Arc chute assembly. 4,107,497, Cl. 200-144.00R.
Jenkins, James R., to Rockwell International Corporation. Multiplex/-demultiplex apparatus. 4,107,469, Cl. 179-15.0BW.
Jenkins, Jonathan Moubray; and Henson, Kenneth, to Unigate Limited. Electro-chemical cells. 4,107,397, Cl. 429-27.000.
Jensen Corporation: *See*—
Allen, William W.; Sweeney, Charles E.; Lundquist, Alvin G., Jr.; and Hersh, Raymond T., 4,106,227, Cl. 38-143.000.
Jensen, Donald Frederick: *See*—
Galetto, Louis Valentine; and Jensen, Donald Frederick, 4,107,698, Cl. 346-75.000.
Jentsch, Hans G. Apparatus for volume dosing compressible, lumpy material. 4,106,160, Cl. 17-32.000.
Jerome Industries Corporation: *See*—
DiGirolamo, John, 4,107,636, Cl. 336-92.000.
Jerome, Robert J.; and Baum, Art. Well casing perforator. 4,106,561, Cl. 166-55.200.
Jersey Nuclear-Avco Isotopes, Inc.: *See*—
Forsen, Harold K.; Janes, George Sargent; and Levy, Richard H., 4,107,537, Cl. 250-423.00P.
Jeser, Jean-Pierre: *See*—
Suzuki, Atsushi; and Jeser, Jean-Pierre, 4,107,273, Cl. 423-263.000.
Jetco, Inc.: *See*—
Davis, Bill G., 4,106,468, Cl. 123-196.00S.
Jewell, Thomas John: *See*—
Webster, John David; and Jewell, Thomas John, 4,107,254, Cl. 264-270.000.
Jewett, Harvey R., to United States of America, Navy. Explosively-separated tongue and groove joint. 4,106,875, Cl. 403-2.000.
John GmbH: *See*—
Gruber, Ludwig, 4,106,425, Cl. 115-42.000.
Johns Hopkins University, The: *See*—
Luke, Perry J.; Machamer, James L.; and Becraft, William A., 4,107,650, Cl. 340-146.1AL.

Johnson, Arthur L., Jr.; and Dodge, Marlow W., to Johnson Enterprises, Inc. Hand-operated pump. 4,106,392, Cl. 92-128.000.

Johnson, Clark E., Jr., to Micro Communications Corporation. High density magnetic storage disc comprising a spiral of magnetic tape. 4,107,752, Cl. 360-135.000.

Johnson, Clifford Carl; and Eitzen, Vincent Elliott, to American Hospital Supply Corporation. Electronic order placement system using signals over telephone line. 4,107,467, Cl. 179-2.0DP.

Johnson, Derwyn C.: *See*—
Hill, Kenneth O.; Kawasaki, Brian S.; and Johnson, Derwyn C., 4,107,628, Cl. 331-94.50N.

Johnson, Donald E. Protective cap assembly for an exhaust pipe. 4,106,290, Cl. 60-324.000.

Johnson Enterprises, Inc.: *See*—
Johnson, Arthur L., Jr.; and Dodge, Marlow W., 4,106,392, Cl. 92-128.000.

Johnson, Homer R.: *See*—
Repik, Albert J.; Miller, Charles E.; and Johnson, Homer R., 4,107,084, Cl. 252-445.000.

Johnson & Johnson: *See*—
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Johnson, Lewis T.: *See*—
Carroll, James C.; and Johnson, Lewis T., 4,106,623, Cl. 206-506.000.
Carroll, James C.; and Johnson, Lewis T., 4,106,625, Cl. 206-507.000.

Johnson, Marshall B., to Wear-Ever Aluminum, Inc. Apparatus for placing comestibles in dispensing mechanism. 4,106,534, Cl. 141-18.000.

Jolly, Ramesh C., to Pfizer Inc. Modified protein. 4,107,334, Cl. 426-7.000.

Jones, Eugene C., to American Hospital Supply Corporation. Container with side sealing closure and method of forming the seal thereof. 4,106,654, Cl. 215-329.000.

Jones, Gary A., to Zenith Radio Corporation. Signal strength responsive sound trap. 4,107,730, Cl. 358-37.000.

Jones, Paul H., to National Rolling Mills Company. Fire-rated ceiling grid cross joint. 4,106,878, Cl. 403-28.000.

Jones, Thornton K.: *See*—
Stayner, Robert A.; Fox, Richard C.; and Jones, Thornton K., 4,106,958, Cl. 148-23.000.

Jornod, Eugene R., to Barber-Colman Company. Fanfold paper transport. 4,107,700, Cl. 346-76.00R.

Jos. Schneider & Co. Optische Werke: *See*—
Raab, Karl-Heinz, 4,107,714, Cl. 354-196.000.

Joslyn Mfg. and Supply Co.: *See*—
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Jost, Walter P., Jr.: *See*—
Brundage, Richard B.; Jost, Walter P., Jr.; and Burroughs, Mortimer P., 4,107,635, Cl. 336-45.000.

Jouret, Edouard Leon Clement, to Crouzet. Timer switch assembly having centrifugal displacement mechanism. 4,107,483, Cl. 200-35.00R.

Joy Manufacturing Company: *See*—
Bailey, Edward A., 4,106,573, Cl. 173-106.000.

Joyce, Thomas F.; and Raguin, Michel M., to Honeywell Information Systems Inc. Microprogram splatter return apparatus. 4,107,774, Cl. 364-200.000.

Jukkola, Walfred Wilhelm, to Dorr-Oliver Incorporated. Solids discharge system with cooling means for pressurized fluid bed reactors. 4,106,210, Cl. 34-10.000.

Julien, Christian: *See*—
Proux, Yves; and Julien, Christian, 4,107,137, Cl. 260-45.85T.

Jurisch, Louis A., to IMC Chemical Group, Inc. Alkanolamine derivatives. 4,107,171, Cl. 260-307.0FA.

K. K. Tokai Rika Denki Seisakusho: *See*—
Inukai, Mitsuo; and Hayashi, Yoshihiro, 4,106,722, Cl. 242-107.700.

Kabel-und Metallwerke Gutehoffnungshutte AG.: *See*—
Albrecht, Werner, 4,106,831, Cl. 339-8.00R.

Kabushiki Kaisha Daini Seikosha: *See*—
Yamashita, Shiro, 4,106,283, Cl. 58-152.00R.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Furuto, Takashi, 4,106,147, Cl. 10-25.000.
Tsuzuku, Akihiko; Tanazawa, Masao; Kaminishi, Masashi; and Imamura, Haruo, 4,106,817, Cl. 302-17.000.

Kabushiki Kaisha Suwa Seikosha: *See*—
Yasuda, Hirofumi, 4,106,278, Cl. 58-23.00A.

Kabushiki Kaisha Terauchi Seisakusho: *See*—
Akiyoshi, Toshio; Onishi, Tsutomu; and Haikawa, Shozo, 4,106,371, Cl. 81-57.140.

Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Asano, Chihiro; Hikita, Shigeyuki; and Kato, Kunio, 4,107,640, Cl. 338-23.000.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Asai, Kiyokazu; and Takeuchi, Akihiro, 4,106,459, Cl. 123-141.000.
Yamada, Masatoshi; Oshima, Yujiro; Hattori, Katsuhiko; and Suzuki, Hideyuki, 4,106,446, Cl. 123-90.130.

Kagan, Sholly: *See*—
Percy, Roger D.; Wilding, David C. M.; and Kagan, Sholly, 4,107,734, Cl. 358-84.000.

Kagawa, Fumio; and Aoki, Norimichi, to Showa Denko K. K. Abrader for mirror polishing of glass. 4,106,915, Cl. 51-296.000.

Kai, Toshio: *See*—
Tanaka, Junzo; and Kai, Toshio, 4,107,502, Cl. 219-10.55F.

Kaiser, Fritz; Schaumann, Wolfgang; Stach, Kurt, deceased; by Plattner, Werner, administrator; and Voightlander, Wolfgang, to Boehringer Mannheim GmbH. Cardioactive 12-epi-digoxin and derivatives thereof. 4,107,299, Cl. 424-182.000.

Kaiser, Gerhard, to Gustav Wagner Maschinenfabrik. Apparatus for avoiding play in the drive of a circular saw. 4,106,378, Cl. 83-74.000.

Kaiser, Klaus: *See*—
Eck, Herbert; Bethe, Elmar; Schwarzbauer, Hans; Spes, Hellmuth; and Kaiser, Klaus, 4,107,002, Cl. 203-75.000.

Kajima Corporation: *See*—
Gerwick, Ben C., Jr., 4,106,301, Cl. 61-86.000.

Kali-Chemie: *See*—
Hauschild, Ulrich; and Roetger, Heinrich, 4,106,922, Cl. 71-42.000.

Kamata, Akira: *See*—
Hirota, Tetsuya; Hishida, Tadashi; Kamata, Akira; Nakazawa, Isao; and Takamisawa, Hiroshi, 4,106,993, Cl. 195-65.000.

Kamath, G. Sanjiv, to Hughes Aircraft Company. High bandgap window layer for GaAs solar cells and fabrication process therefor. 4,107,723, Cl. 357-30.000.

Kamei, Tatsuya: *See*—
Naito, Masayoshi; and Kamei, Tatsuya, 4,107,731, Cl. 357-64.000.

Kameyama, Akinori; Matsunaga, Yoshiki; and Saito, Hiroyasu, to Nippon Kasei Chemical Co., Ltd. Adhesive composition rapidly hardenable at room temperature. 4,107,119, Cl. 260-29.4UA.

Kameyama, Toshiaki: *See*—
Tani, Tatsuo; and Kameyama, Toshiaki, 4,106,763, Cl. 271-9.000.

Kaminishi, Masashi: *See*—
Tsuzuku, Akihiko; Tanazawa, Masao; Kaminishi, Masashi; and Imamura, Haruo, 4,106,817, Cl. 302-17.000.

Kamiuchi, Junichi: *See*—
Akiyama, Keiichi; Kamiuchi, Junichi; Matsuda, Itsuo; and Fujii, Takara, 4,107,153, Cl. 528-322.000.

Kamp, Lars Ragnar: *See*—
Borg, Lars Uno; Kamp, Lars Ragnar; and Olsson, Kjell Olow Ingemar, 4,107,253, Cl. 246-182.00B.

Kanao, Mitsuhiro. Internal combustion engine. 4,106,439, Cl. 123-75.00B.

Kaneko, Yasuhisa: *See*—
Bunda, Tsuchio; Niimi, Itaru; Kaneko, Yasuhisa; and Noda, Fumiyoshi, 4,106,913, Cl. 23-288.0FC.

Kanie, Takashi: *See*—
Tanahashi, Jun'ichi; and Kanie, Takashi, 4,107,652, Cl. 340-146.1AL.

Kanner, Bernard: *See*—
Prokai, Bela; and Kanner, Bernard, 4,107,068, Cl. 252-182.000.

Kanno, Hideyuki, to Tomy Kogyo Co., Inc. Amusement device. 4,106,768, Cl. 273-1.00M.

Kanno, Tomoei; Watanabe, Hiroaki; and Sano, Shohachiro, to Showa Sangyo Co. Ltd. Method of isomerizing glucose to fructose. 4,106,987, Cl. 195-31.00F.

Kano, Tamotsu: *See*—
Ohsugi, Katsuhisa; Takeuchi, Daizo; Hamada, Masahiro; and Kano, Tamotsu, 4,106,988, Cl. 195-49.000.

Kansai Paint Company, Limited: *See*—
Nakayama, Yasuharu; Hirata, Nobuhito; and Yamashita, Yoshio, 4,107,114, Cl. 260-22.0CB.

Kanzaki, Hidetosi: *See*—
Hosoi, Keizo; Endo, Tadayoshi; and Kanzaki, Hidetosi, 4,107,128, Cl. 260-40.00R.

Kaplan, Gerald Stanley, to RCA Corporation. Digitally processed radar speed sensor. 4,107,680, Cl. 343-8.000.

Kaplan, Neil B. Vehicle antitheft system. 4,107,543, Cl. 307-10.0AT.

Karady, Sandor: *See*—
Christensen, Burton G.; Cama, Lovji D.; Karady, Sandor; and Sletzinger, Meyer, 4,107,432, Cl. 544-21.000.

Karden, Karl Gosta; and Berger, Karl Gustav, to Atlas Copco Aktiebolag. Safety valve for pneumatic tools. 4,106,750, Cl. 251-282.000.

Karges, Hermann Erich; and Heimburger, Norbert, to Behringwerke Aktiengesellschaft. Quantitative determination of antithrombin III. 4,106,990, Cl. 195-63.000.

Karlson, Eskil. Electromatographic separating apparatus and system. 4,107,041, Cl. 210-198.00C.

Karoly, Gabriel; and Gardon, John L., to American Can Company. Method for photopolymerization of pigmented epoxide compositions. 4,107,353, Cl. 427-54.000.

Kaspar, Don G., to Kaspar Wire Works, Inc. Removable front panel. 4,106,609, Cl. 194-1.00B.

Kaspar Wire Works, Inc.: *See*—
Kaspar, Don G., 4,106,609, Cl. 194-1.00B.

Kassal, Robert James, to Du Pont de Nemours, E. I., and Company. Reactive compositions and polymers made therefrom. 4,107,109, Cl. 260-4.00R.

Kasuga, Toshishige: *See*—
Campbell, George Thomas Richardson; Kasuga, Toshishige; and Ohno, Kosaku, 4,106,641, Cl. 214-15.00R.

Kasuya, Takanori: *See*—
Ban, Itsuki; Nozaki, Sumio; Kasuya, Takanori; Shinkado, Yukio; and Yano, Kanji, 4,107,750, Cl. 360-106.000.

Kataoka, Hiroshi: *See*—
Yasuike, Akio; Kataoka, Hiroshi; Fujikawa, Tutomu; and Suzuki, Naoto, 4,106,887, Cl. 425-549.000.

Kataoka, Shoei; Hashizume, Nobuo; and Kodera, Hiroshi, to Agency of Industrial Science & Technology. Bulk semiconductor logic device. 4,107,718, Cl. 357-3.000.

Katayama, Hajime: *See*—
Kondo, Eiichi; Katayama, Hajime; Takahashi, Toru; and Komiya, Yutaka, 4,106,870, Cl. 355-4.000.

Katchka, Jay R., to Robertshaw Controls Company. Burner ignition system. 4,106,889, Cl. 431-46.000.

Kato, Kunio: *See—*
Asano, Chihiro; Hikita, Shigeyuki; and Kato, Kunio, 4,107,640, Cl. 338-23.000.

Katsevich, Leonid Savvich: *See—*
Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pirogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Borisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; Shevtsov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich; Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mateshin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich; Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich; Koen, David Matveevich; Seleverstov, Vladimir Vasilievich; Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pizogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Bozisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zakharovich, 4,107,449, Cl. 13-35.000.
Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pirogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Borisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; Shevtsov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich; Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mateshin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich; Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich; Koen, David Matveevich; Seleverstov, Vladimir Vasilievich; Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pizogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Bozisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zakharovich, 4,107,449, Cl. 13-35.000.

Kaufman, Jerome G., to Naarden International Holland, B.V. Use of substituted pyrans as deodorant chemicals. 4,107,289, Cl. 424-45.000.

Kaufmann, Frank H., to Steel Heddle Manufacturing Company. Heddle frame. 4,106,529, Cl. 139-92.000.

Kaufmann, Frank H. Heddle frame. 4,106,530, Cl. 139-92.000.

Kaufmann, Meinolph, to BBC Brown Boveri & Company Limited. Liquid-crystal cell. 4,106,860, Cl. 350-343.000.

Kaufmann, Meinolph: *See—*
Doriguzzi, Rino; Egloff, Markus; Kaufmann, Meinolph; Nehring, Jurgen; and Scheffer, Terry J., 4,106,859, Cl. 350-338.000.

Kawada, Toyoshi; Andoh, Shizuo; and Yoshikawa, Kazuo, to Fujitsu Limited. Gas discharge panel drive system. 4,107,578, Cl. 315-169.0TV.

Kawaharada, Minoru: *See—*
Yanagimoto, Samon; Kawaharada, Minoru; Nagata, Shuji; and Koyama, Fujimasa, 4,106,318, Cl. 72-199.000.

Kawanami, Mitsuru; Okuhara, Shinzi; and Mukaemachi, Takuzi, to Hitachi, Ltd. Semiconductor channel switch. 4,107,472, Cl. 179-18.0GF.

Kawasaki, Brian S.: *See—*
Hill, Kenneth O.; Kawasaki, Brian S.; and Johnson, Derwyn C., 4,107,628, Cl. 331-94.50N.

Kawase, Shoji: *See—*
Inata, Hiroo; Morinaga, Tsuto; Kuratsuji, Takatoshi; Urasaki, Takanori; and Kawase, Shoji, 4,107,143, Cl. 528-176.000.

Kawawa, Shigenobu: *See—*
Takahashi, Yoshiyuki; Nagai, Akihiko; Kawawa, Shigenobu; Kubozono, Hidetaka; and Tanaka, Mitsuo, 4,106,329, Cl. 73-15.00B.

Kayser-Roth Corporation: *See—*
Gebhardt, Roland; and Gersin, Robert P., 4,106,668, Cl. 221-131.000.

Keane, Francis Xavier. Hospital beds. 4,107,490, Cl. 200-52.00R.

Keenan, William Douglas Sulman: *See—*
Zurbrigg, Charles Edward; and Keenan, William Douglas Sulman, 4,106,120, Cl. 2-51.000.

Kellems, Kenneth K.; and Brydolf, Robert, to Acme General Corporation. Adjustable height door pivot. 4,106,158, Cl. 16-129.000.

Keller, Alfred A.; Russo, Robert V.; and Treadwell, Kenneth, to M&T Chemicals Inc. Storage-stable precursors for rigid polyurethane foams. 4,107,069, Cl. 252-182.000.

Keller, Frank R.; Kussy, Frank W.; DiMarco, Bernard; and Fenneteau, Michel M., to Gould Inc. Platform mounted switch operating mechanism. 4,107,488, Cl. 200-50.00A.

Kellermeyer, Janet R.; and Alexander, Jay M. Blockage prevention device for body fluid collection systems. 4,106,507, Cl. 128-295.000.

Kelly, Robert C., to Upjohn Company, The. Process and intermediates for preparing Thromboxane B_1 4,107,427, Cl. 542-427.000.

Kemnitz, Robert H., to Allis-Chalmers Corporation. Feed distributor for gyratory crusher. 4,106,707, Cl. 241-202.000.

Kemp, Horace N.: *See—*
Hartbauer, Ellsworth A.; Weis, Rudolf R.; and Kemp, Horace N., 4,106,684, Cl. 226-91.000.

Kendall Company, The: *See—*
McWhorter, Daniel M., 4,106,509, Cl. 128-349.00B.
Taylor, Glenn N., 4,106,675, Cl. 222-556.000.

Kennecott Copper Corporation: *See—*
Lueders, Robert E.; Kust, Roger N.; and Davies, David S., 4,107,262, Cl. 423-32.000.

Kennedy, Harold L., to Del Mar Avionics. Vectorcardiographic method for ambulatory patients. 4,106,495, Cl. 128-2.06V.

Kennedy, James: *See—*
Clark, John Colin; Kennedy, James; Long, Alan Gibson; and Weir, Niall Galbraith, 4,107,431, Cl. 544-16.000.

Kennington, Rowland; and Woolhouse, Robin Andrew, to Imperial Chemical Industries Limited. Preparation of the reaction product of urea and alkali metal hydroxide or carbonate. 4,107,053, Cl. 252-2.000.

Kenworthy, E. J. Doyle, to Mead Corporation, The. Trenched stimulating plate. 4,107,699, Cl. 346-75.000.

Kermisch, Dorian: *See—*
Conwell, Esther M.; Kermisch, Dorian; Maher, James C.; Pfister, Gustav R.; and Schank, Richard L., 4,106,848, Cl. 350-96.140.

Kessler, Erich; Hassemer, Georg; and Weber, Paul, to Fried. KRUPP Gesellschaft mit beschrankter Haftung. Cooling tower. 4,106,244, Cl. 52-63.000.

Kevorkian, Victor; and Cumings, Francis J., to Ingersoll-Rand Research, Inc. Methods for converting coal to a plastic-like condition and feeding same to a receiver. 4,106,997, Cl. 201-32.000.

Khera, Surjit Singh, to Battelle Development Corporation. Catalyst for synthesizing a gaseous hydrocarbon mixture having a high methane content from carbon monoxide and hydrogen. 4,107,091, Cl. 252-466.00J.

Kiefer, Richard J. Static eliminator and ion discharge means therefor. 4,107,755, Cl. 361-220.000.

Kievits, Anton, to N. V. Bekaert S.A. Body supporting furniture frame. 4,106,140, Cl. 5-191.000.

Kiewit, David A., to Gould Inc. Digital output force sensor using surface acoustic waves. 4,107,626, Cl. 331-65.000.

Kihara, Kunio: *See—*
Tamura, Noriyoshi; and Kihara, Kunio, 4,107,098, Cl. 521-25.000.

Kijima, Shizumasa; Igarashi, Toshiji; Yamatsu, Isao; Hamamura, Kimio; Nakajima, Yoshikage; Minami, Norio; Yamagishi, Youji; and Inai, Yuithi, to Eisai Co., Ltd. Polyprenyl carboxylic acid compound. 4,107,193, Cl. 260-410.000.

Kikuchi, Sakae: *See—*
Ikezawa, Ryuichi; Sasayama, Atsushi; and Kikuchi, Sakae, 4,107,727, Cl. 357-72.000.

Kildal, Helge; and Brueck, Steven R. J., to Massachusetts Institute of Technology. Two-photon resonant laser mixing in molecular liquids. 4,107,544, Cl. 307-88.300.

Kilgore, Bevil J.: *See—*
McDowell, Robert, 4,107,789, Cl. 366-3.000.

Kim, Sung Baik. Rigidized shaft construction for sports apparatus. 4,106,777, Cl. 273-80.00B.

Kimball International, Inc.: *See—*
Whittington, Billy J.; Robinson, John William; and Dietrich, Ralph N., 4,106,384, Cl. 84-1.190.

Kimm, Herbert J. Electrical wire connecting device for junction box. 4,106,835, Cl. 339-95.00D.

Kimura, Shigeo: *See—*
Higuchi, Shigetaka; Iwasaki, Masaatsu; and Kimura, Shigeo, 4,107,385, Cl. 428-412.000.

Kimura, Toshihiko; and Nakayama, Tsuneo, to Akebono Brake Company, Ltd. Disc brake caliper and supporting member. 4,106,595, Cl. 188-73.300.

King, J. Frank, to Hanes Corporation. Article folding and packaging system. 4,106,260, Cl. 53-21.0FW.

King, James Ping; Mailey, Everett A.; and Popoff, Ivan Christoff, to Pennwalt Corporation. Polymer of 1,2,4-thiadiazole and lubricants containing it as an additive. 4,107,059, Cl. 252-28.000.

Kinzler, Raymond Carl, to Koppers Company, Inc. High pressure water cleaner for ascension pipes. 4,107,001, Cl. 202-241.000.

Kirk, Donald W.: *See—*
Beston, George H.; and Kirk, Donald W., 4,107,344, Cl. 426-625.000.

Kirkland, James L., to United States of America, Navy. Magnetometer using a field controlled oscillator, the oscillator core being maintained near its Curie point. 4,107,607, Cl. 324-253.000.

Kirsch, Andrew F.; and Koob, Robert W., to Westinghouse Electric Corp. Elevator system. 4,106,594, Cl. 187-29.00R.

Kirsch, Jerry. Laser workpiece position and presence inspector and machine control governor. 4,107,539, Cl. 250-561.000.

Kirsch, Jerry. Workpiece hole presence and absence inspector. 4,107,541, Cl. 250-571.000.

Kitasato Institute, The: *See—*
Omura, Satoshi; Iwai, Yuzuru; and Hirano, Atsushi, 4,107,297, Cl. 424-122.000.

Klauke, Erich: *See—*
Petruck, Gerd-Michael; Klauke, Erich; and Jager, Horst, 4,107,186, Cl. 260-351.000.

Klaus, Heck, to Audi Nsu Auto Union Aktiengesellschaft. Process for production of oil control rings. 4,106,977, Cl. 156-645.000.

Klimin, Alexandr Ivanovich; Mostovsky, Alexandr Alexeevich; and Nemchenok, Rafail Lvovich. Photoemitter. 4,107,564, Cl. 313-94.000.

Klisch, Stephen Cajetan; and Martin, Charles Andrew, to Colgate-Palmolive Company. Liquid olefin sulfonate detergent compositions containing anti-gelling agents. 4,107,095, Cl. 252-541.000.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See—*
Kohler, Wolfgang, 4,106,458, Cl. 123-139.0AT.
Zenker, Walter; and Hulsebusch, Karl-Heinz, 4,106,364, Cl. 74-740.000.

Kloster, William R.; and Stewart, Patrick H., to C L Industries Inc. Method of automatic mold and core forming. 4,106,545, Cl. 164-18.000.

Klotzner, Winfried; Daumer, Rolf; Busse, Wolfgang; and du Mont, Hans-Christoph, to Robert Bosch GmbH. Method and apparatus for addressing a digital memory. 4,107,717, Cl. 364-431.000.

Klug, Anton L. Device for completing an electric circuit or the like for a lock or the like. 4,107,485, Cl. 200-43.000.

Knapik, H. Peter G.: *See*—
Adams, Frank H.; and Knapik, H. Peter G., 4,107,083, Cl. 252-439.000.

Knorre, Helmut; Fischer, Joachim; and Pohl, Gerhard, to Duetsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for preventing caking and obtaining flowability of alkali chlorides and salt mixtures thereof. 4,107,274, Cl. 423-268.000.

Knudson, Henry T., to Allis-Chalmers Corporation. Adjustable ground roller for mower. 4,106,269, Cl. 56-15.800.

Kobayashi, Hajime; Yano, Yasuhiro; and Endo, Ichiro, to Canon Kabushiki Kaisha. Electrostatic printing method. 4,106,409, Cl. 101-426.000.

Kobayashi, Nobuyuki: *See*—
Norimatsu, Hideaki; Nakamura, Mitsuo; and Kobayashi, Nobuyuki, 4,106,450, Cl. 123-119.0EC.

Kobayashi, Yukinari: *See*—
Suzuki, Nobuyuki; Kobayashi, Yukinari; Hiyoshi, Yumiko; Takagi, Seiji; Sone, Takanori; Wakabayashi, Mikio; and Sowa, Tuneo, 4,107,162, Cl. 544-313.000.

Kobe Steel, Ltd.: *See*—
Fukuzuka, Toshio; Shimogori, Kazutoshi; and Satoh, Hiroshi, 4,107,024, Cl. 204-275.000.

Koch, Kjell, to Aktiebolaget Tudor. Battery and grid for positive electrode for lead storage batteries. 4,107,407, Cl. 429-225.000.

Kochs, H. W., Jr.: *See*—
Oliphant, Howard G., 4,106,236, Cl. 49-141.000.

Kodaira, Hiroshi; and Masuda, Mitsuo, to Kuroda Seiko Co., Ltd. Pneumatic linear actuator. 4,106,390, Cl. 91-42.000.

Kodera, Hiroshi: *See*—
Kataoka, Shoei; Hashizume, Nobuo; and Kodera, Hiroshi, 4,107,718, Cl. 357-3.000.

Koehn, Elizabeth M., executrix: *See*—
Koehn, Wilbur R., deceased; Koehn, Elizabeth M., executrix; and Ellenoff, Theodore, executor, 4,106,506, Cl. 128-214.400.

Koehn, Wilbur R., deceased; Koehn, Elizabeth M., executrix; and Ellenoff, Theodore, executor. Catheter. 4,106,506, Cl. 128-214.400.

Koen, David Matveevich: *See*—
Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pirogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Borisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; Shevtsov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich; Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mateshin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich; Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich; Koen, David Matveevich; Seleverstov, Vladimir Vasilievich; Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pizogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Bozisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zakharovich, 4,107,449, Cl. 13-35.000.

Koerner, Heinz Albrecht, to MBI Corporation. Gripper for case unloader. 4,106,612, Cl. 198-479.000.

Koert, James M.: *See*—
Marshall, Vincent P.; Elrod, David W.; Koert, James M.; Reisender, Elizabeth A.; and Wiley, Paul F., 4,106,994, Cl. 195-80.00R.

Kohler, Wolfgang, to Klockner-Humboldt-Deutz Aktiengesellschaft. Fuel injector. 4,106,458, Cl. 123-139.0AT.

Kojima, Chiaki: *See*—
Otobe, Takashi; Kojima, Chiaki; and Ohki, Hiroshi, 4,107,729, Cl. 358-4.000.

Kojima, Toshifumi: *See*—
Koshiga, Fusao; Tanaka, Jinkichi; Watanabe, Itaru; Suzuki, Motoaki; Kojima, Toshifumi; Matsubara, Hiroyoshi; Osuka, Tatsumi; Takeshige, Kenji; Nagamine, Takashi; and Hirano, Osamu, 4,107,503, Cl. 219-61.000.

Kolb, Robert W.: *See*—
Ratcliffe, Walter James; Kolb, Robert W.; and Bruce, S. Esson, 4,107,368, Cl. 428-245.000.

Kolesnikova, Galina Prokofievna: *See*—
Moiseev, Vladimir Vasilievich; Kosovtsev, Vladimir Vasilievich; Kolesnikova, Galina Prokofievna; Esina, Tamara Ivanovna; Polukhin, Alexandr Nikolaevich; and Zimnukhov, Viktor Alexandrovich, 4,107,141, Cl. 528-129.000.

Koller, Thomas J.; and Randmer, Jacob A., to Machlett Laboratories, Inc., The. X-ray beam generator. 4,107,562, Cl. 313-59.000.

Kolomeichuk, Alexandr Ivanovich: *See*—
Kucherenko, Vladimir Ilich; Flerov, Valery Nikolaevich; Korolev, Georgy Vladimirovich; Kotov, Evgeny Pavlovich; Praporov, Anatoly Mikhailovich; Batova, Galina Alexandrovna; Melikova, Gayane Leonovna; and Kolomeichuk, Alexandr Ivanovich, 4,107,011, Cl. 204-151.000.

Komatsu, Akio: *See*—
Endo, Hirohido; Inose, Fumiyuki; and Komatsu, Akio, 4,107,662, Cl. 340-324.0AD.

Komiya, Yutaka: *See*—
Kondo, Eiichi; Katayama, Hajime; Takahashi, Toru; and Komiya, Yutaka, 4,106,870, Cl. 355-4.000.

Komura, Ichiro; Awao, Takeyoshi; and Yamada, Kazuhiko, to Ajinomoto Co., Inc. Thermostable cellulase and a method for producing the same. 4,106,989, Cl. 195-62.000.

Kondo, Eiichi; Katayama, Hajime; Takahashi, Toru; and Komiya, Yutaka, to Canon Kabushiki Kaisha. Color electrophotographic method and apparatus. 4,106,870, Cl. 355-4.000.

Kondo, Osamu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Device for moving curved plate bent in a substantially arcuate-shape along curved path. 4,106,353, Cl. 74-45.000.

Kondo, Shinichi: *See*—
Umezawa, Hamao; Umezawa, Sumio; Maeda, Kenji; Tsuchiya, Osamu; Kondo, Shinichi; and Fukatsu, Shunzo, 4,107,424, Cl. 536-10.000.

Konig, Eberhard; and Pedain, Josef, to Bayer Aktiengesellschaft. Bis-(isocyanatopropyl) arylacetonitriles. 4,107,199, Cl. 260-465.00D.

Konig, Eberhard; and Pedain, Josef, to Bayer Aktiengesellschaft. Bis-(aminopropyl) arylacetonitriles and preparation thereof. 4,107,200, Cl. 260-465.00E.

Konig, Hans-Bodo: *See*—
Schrock, Wilfried; Konig, Hans-Bodo; Preiss, Michael; Metzger, Karl Georg; and Walkowiak, Michael, 4,107,304, Cl. 424-246.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Tomono, Makoto; Yamakawa, Goichi; and Ohta, Mitsunori, 4,107,062, Cl. 252-62.10P.

Kono, Hiroshi; Kubo, Sueki; and Matsuno, Tadahiko, to Kurosaki Refractories Co., Ltd. Apparatus for repairing the furnace lining with a spray pipe of non-circular hollow cross section. 4,106,760, Cl. 266-281.000.

Konrad, Frederick Miller; and Mason, Stephen Howard, to Union Carbide Corporation. Decoloration of bisphenol-A recycle stream with cation exchange resin. 4,107,218, Cl. 560-724.000.

Koob, Robert W.: *See*—
Kirsch, Andrew F.; and Koob, Robert W., 4,106,594, Cl. 187-29.00R.

Kool, Boris: *See*—
Cormack, Alexander D.; and Kool, Boris, 4,106,778, Cl. 277-9.500.

Kopecny, Miroslav: *See*—
Maler, Josef; Fischer, Evzen; Losert, Miloslav; and Kopecny, Miroslav, 4,106,312, Cl. 66-50.00R.

Kopera, Joseph J., to Chrysler Corporation. Hall effect electronic ignition control unit with automatic shut-down timer. 4,106,460, Cl. 123-146.50D.

Koppelman, Edward; and Murray, Robert G., to Koppelman, Edward. Continuous thermal reactor. 4,106,999, Cl. 202-118.000.

Koppers Company, Inc.: *See*—
Curtis, John Markley, Jr.; and Shepler, Paul Roberts, 4,106,463, Cl. 123-193.00P.
Hayduk, Harry Nicholas, 4,106,642, Cl. 214-18.00R.
Hyde, Glenn F.; and Alban, Thomas W., 4,106,782, Cl. 277-235.00A.
Kinzler, Raymond Carl, 4,107,001, Cl. 202-241.000.

Korf, Heinz Ludwig, to Rapperswill Corporation. Cellular urea-formaldehyde resin and method of preparing the same. 4,107,105, Cl. 521-80.000.

Korolev, Georgy Vladimirovich: *See*—
Kucherenko, Vladimir Ilich; Flerov, Valery Nikolaevich; Korolev, Georgy Vladimirovich; Kotov, Evgeny Pavlovich; Praporov, Anatoly Mikhailovich; Batova, Galina Alexandrovna; Melikova, Gayane Leonovna; and Kolomeichuk, Alexandr Ivanovich, 4,107,011, Cl. 204-151.000.

Koseki, Teruo: *See*—
Tanaka, Hiroyoshi; Koseki, Teruo; and Fujii, Shigeru, 4,107,129, Cl. 260-40.00P.

Koshiga, Fusao; Tanaka, Jinkichi; Watanabe, Itaru; Suzuki, Motoaki; Kojima, Toshifumi; Matsubara, Hiroyoshi; Osuka, Tatsumi; Takeshige, Kenji; Nagamine, Takashi; and Hirano, Osamu, to Nippon Kokan Kabushiki Kaisha. Method for eliminating residual magnetism in pipe-blank for welded steel pipe longitudinally seam-welded from inside. 4,107,503, Cl. 219-61.000.

Kosovtsev, Vladimir Vasilievich: *See*—
Moiseev, Vladimir Vasilievich; Kosovtsev, Vladimir Vasilievich; Kolesnikova, Galina Prokofievna; Esina, Tamara Ivanovna; Polukhin, Alexandr Nikolaevich; and Zimnukhov, Viktor Alexandrovich, 4,107,141, Cl. 528-129.000.

Kostecky, James F., to Bethlehem Steel Corporation. Base bracket for shelving. 4,106,738, Cl. 248-235.000.

Koszarewski, Zbigniew: *See*—
Murza-Mucha, Pawel; Koszarewski, Zbigniew; Ostaszewski, Wojciech; and Peksa, Stanislaw, 4,106,548, Cl. 164-132.000.

Kotabe, Munenori; and Nomura, Yasuji, to Hitachi, Ltd. X-ray apparatus utilizing rotary anode type X-ray tubes. 4,107,535, Cl. 250-406.000.

Kotani, Tamotsu: *See*—
Izumi, Sachio; and Kotani, Tamotsu, 4,107,508, Cl. 219-137.700.

Kotov, Evgeny Pavlovich: *See*—
Kucherenko, Vladimir Ilich; Flerov, Valery Nikolaevich; Korolev, Georgy Vladimirovich; Kotov, Evgeny Pavlovich; Praporov, Anatoly Mikhailovich; Batova, Galina Alexandrovna; Melikova,

Gayane Leonovna; and Kolomeichuk, Alexandr Ivanovich, 4,107,011, Cl. 204-151.000.

Kountz, Jack Merriel: *See*—
Weigand, Rex Olen; McMillen, Kenneth Ray; Fulk, Ronald Dean; Prichard, Daniel Ray; and Kountz, Jack Merriel, 4,106,270, Cl. 56-98.000.

Kovac, Zlata; and Sambucetti, Carlos Juan, to International Business Machines Corporation. Water based selectable charge magnetic inks. 4,107,063, Cl. 252-62.520.

Koyama, Fujimasa: *See*—
Yanagimoto, Samon; Kawaharada, Minoru; Nagata, Shuji; and Koyama, Fujimasa, 4,106,318, Cl. 72-199.000.

Koyanagi, Haruo: *See*—
Morimoto, Katsuhide; Matsumura, Masaji; Yamauchi, Nobuharu; Koyanagi, Haruo; Sato, Iwao; Yasuhara, Buhei; and Sakai, Jiro, 4,107,663, Cl. 340-324.0AD.

Kozinczuk, Orest A.: *See*—
Shulz, Robert J.; and Kozinczuk, Orest A., 4,107,511, Cl. 219-286.000.

Kozulla, Robert E., to Weatherhead Company, The. Disposable centrifugal separator. 4,106,689, Cl. 233-23.00R.

Kramer, Friedhelm: *See*—
Heinrich, Hans Juergen; Rademacher, Karl August; Strohn, Helmut; and Kramer, Friedhelm, 4,107,042, Cl. 210-225.000.

Kramer, Fritz. Apparatus for spraying plastic foam. 4,107,075, Cl. 252-359.00E.

Krascella, Nicholas Leo: *See*—
Meyerand, Russell Gilbert, Jr.; Krascella, Nicholas Leo; and McMahon, David Gue, 4,107,010, Cl. 204-129.000.

Kraus, Edmund Joseph: *See*—
Kraus, Robert August; and Kraus, Edmund Joseph, 4,106,370, Cl. 73-88.00F.

Kraus, Robert August; and Kraus, Edmund Joseph. Electric infinite-range load-sensing transducer. 4,106,370, Cl. 73-88.00F.

Kravitz, Hilard L. Dietary salt compositions. 4,107,346, Cl. 426-648.000.

Kravitz, Jerome H. Solar panel unit. 4,106,952, Cl. 136-89.0HY.

Krawagna, Alois, to Sports Technology Inc. Golf swing practice base. 4,106,772, Cl. 273-186.00R.

Kreitz, Lloyd D. Extension table for table saws. 4,106,381, Cl. 83-477.200.

Kreuger, Frederik Hendrik; and Van Kesteren, Jacobus Petrus Ignatius, to N.K.F. Kabel B.V. Method of manufacturing a longitudinally watertight telecommunication cable. 4,106,961, Cl. 156-48.000.

Krochta, John M.: *See*—
Robertson, George H.; Lazar, Melvin E.; Krochta, John M.; Farkas, Daniel F.; and Bomben, John L., 4,107,340, Cl. 426-481.000.

Kroder, Ernest A.: *See*—
McCandless, William; Leu, Robert F.; Kroder, Ernest A.; and Tomecek, Charles J., 4,106,242, Cl. 51-225.000.

Kronlage, John W., to Texas Instruments Incorporated. Dual slope analog-to-digital converter with unique counting arrangement. 4,107,667, Cl. 340-347.0NT.

Kropa, Gomer E., to Leesona Corporation. Granulator and knife construction therefor. 4,106,708, Cl. 241-222.000.

Kruger, Kurt John: *See*—
Spilman, Raymond; Haase, Edward Emil, Jr.; Kruger, Kurt John; Budnick, Donald Barry; and Lasorso, Vincent John, Jr., 4,106,490, Cl. 128-2.00F.

Kruklitis, Karlis, to Burroughs Corporation. Document processing, magnetic character detecting apparatus. 4,107,653, Cl. 340-146.3C.

Krupinski, Kenneth C.: *See*—
Augustine, Harry G.; Krupinski, Kenneth C.; and Smith, Frank A., 4,107,382, Cl. 428-368.000.

Krupp-Koppers GmbH: *See*—
Herzig, Alfred, 4,106,533, Cl. 141-1.000.

Kubens, Rolf, to Bayer Aktiengesellschaft. Process for the production of crosslinked, urethane-containing plastics. 4,107,101, Cl. 521-137.000.

Kubo, Sueki: *See*—
Kono, Hiroshi; Kubo, Sueki; and Matsuno, Tadahiko, 4,106,760, Cl. 266-281.000.

Kubozono, Hidetaka: *See*—
Takahashi, Yoshiyuki; Nagai, Akihiko; Kawawa, Shigenobu; Kubozono, Hidetaka; and Tanaka, Mitsuo, 4,106,329, Cl. 73-15.00B.

Kucher, Robert C. Cable hauling winch. 4,106,754, Cl. 254-186.0HC.

Kucherenko, Vladimir Ilich; Flerov, Valery Nikolaevich; Korolev, Georgy Vladimirovich; Kotov, Evgeny Pavlovich; Praporov, Anatoly Mikhailovich; Batova, Galina Alexandrovna; Melikova, Gayane Leonovna; and Kolomeichuk, Alexandr Ivanovich. Method of regeneration of spent etching solutions. 4,107,011, Cl. 204-151.000.

Kudrin, Viktor Alexandrovich: *See*—
Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pirogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexaadrovich; Borisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; Shevtsov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich; Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mateshin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich; Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich; Koen, David Matveevich; Seleverstov, Vladimir Vasilievich; Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pizogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Borisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; Shevtsov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich; Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mateshin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich; Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich; Koen, David Matveevich; Seleverstov, Vladimir Vasilievich; Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pizogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Bozisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zakharovich, 4,107,449, Cl. 13-35.000.

Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pirogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Borisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; Shevtsov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich; Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mateshin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich; Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich; Koen, David Matveevich; Seleverstov, Vladimir Vasilievich; Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pizogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Bozisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zakharovich, 4,107,449, Cl. 13-35.000.

Kudryavtsev, Valentin Semenovich: *See*—
Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pirogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Borisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; Shevtsov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich; Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mateshin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich; Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich; Koen, David Matveevich; Seleverstov, Vladimir Vasilievich; Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pizogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Bozisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zakharovich, 4,107,449, Cl. 13-35.000.

Kuhla, Donald E.; and Watson, Harry A., Jr., to Pfizer Inc. Conversion of trans- to cis-N,N-dimethyl-9-[3-(4-methyl-1-piperazinyl)-propylidene]-thioxanthene-2-sulfonamide and recovery of the cis-isomer. 4,107,430, Cl. 542-471.000.

Kuhn, Charles J. Chisel clamp for use in straightening automobile bodies. 4,106,325, Cl. 72-457.000.

Kulite Semiconductor Products, Inc.: *See*—
Kurtz, Anthony D., 4,106,349, Cl. 73-746.000.

Kulwicki, Bernard Michael, to Texas Instruments Incorporated. Compact PTC resistor. 4,107,515, Cl. 219-541.000.

Kumaki, Noboru, to Sony Corporation. Fluidic controlled cartridge ejector. 4,107,747, Cl. 360-93.000.

Kun-Ming, Liu. Safety fuel gas and apparatus for generating the same. 4,106,914, Cl. 48-103.000.

Kunii, Nobuaki: *See*—
Ukihashi, Hiroshi; Uchino, Tetsuya; Abe, Takeshi; and Kunii, Nobuaki, 4,107,356, Cl. 427-195.000.

Kunitomo, Akihiko: *See*—
Nakamura, Toshiie; Shimizu, Hiromichi; Tanaka, Kyuichi; Kunitomo, Akihiko; and Tanizawa, Kinji, 4,107,300, Cl. 424-200.000.

Kuno, Masanori: *See*—
Nagara, Toshio; Nakagawa, Kogoro; Higo, Nobumasa; Kuno, Masanori; Arai, Hiroshi; and Ota, Jun, 4,107,493, Cl. 200-84.00C.

Kuratsuji, Takatoshi: *See*—
Inata, Hiroo; Morinaga, Tsuto; Kuratsuji, Takatoshi; Urasaki, Takanori; and Kawase, Shoji, 4,107,143, Cl. 528-176.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Haga, Toshikatsu; and Hori, Saburo, 4,106,892, Cl. 432-58.000.
Ohsugi, Katsuhisa; Takeuchi, Daizo; Hamada, Masahiro; and Kano, Tamotsu, 4,106,988, Cl. 195-49.000.

Kurihara, Yasuo, to Fujitsu Limited. Check system for detecting malfunction of an error detection circuit. 4,107,649, Cl. 340-146.1AG.

Kuroda Seiko Co., Ltd.: *See*—
Kodaira, Hiroshi; and Masuda, Mitsuo, 4,106,390, Cl. 91-42.000.

Kurokawa, Hideo: *See*—
Taniyasu, Ryozo; Kurokawa, Hideo; and Saito, Takeshi, 4,107,080, Cl. 252-431.00C.

Kurosaki Refractories Co., Ltd.: *See*—
Kono, Hiroshi; Kubo, Sueki; and Matsuno, Tadahiko, 4,106,760, Cl. 266-281.000.

Kurose, Kunio: *See*—
Matsumoto, Noboru; Kurose, Kunio; and Ueno, Kinya, 4,106,449, Cl. 123-119.00A.

Kurtz, Anthony D., to Kulite Semiconductor Products, Inc. Transducer structures for high pressure application. 4,106,349, Cl. 73-746.000.

Kussy, Frank W.: *See*—
Keller, Frank R.; Kussy, Frank W.; DiMarco, Bernard; and Fenneteau, Michel M., 4,107,488, Cl. 200-50.00A.

Kust, Roger N.: *See*—
Lueders, Robert E.; Kust, Roger N.; and Davies, David S., 4,107,262, Cl. 423-32.000.

Kusumoto, Keiichi: *See*—
Nakajima, Takashi; Irie, Tomoyuki; and Kusumoto, Keiichi, 4,106,430, Cl. 118-64.000.

Kusunose, Tetsuhiro; Shima, Tsukasa; Henmi, Hiroshi; and Yasui, Sadahiko, to Asahi Kasei Kogyo Kabushiki Kaisha. Non-woven

fabric usable as a substratum sheet for artificial leather. 4,107,374, Cl. 428-288.000.

Kutnyak, Thomas A.; Dunn, George T.; and Guiles, Chester L., to Automation Industries, Inc. Method of making a formed hose. 4,106,968, Cl. 156-189.000.

Kutzscher, Edgar W.: *See*—
Brumfield, Elvin S.; Kutzscher, Edgar W.; and Lovelady, James N., 4,107,530, Cl. 250-342.000.

Kuwahara, Hiroshi: *See*—
Ishida, Yotsuo; and Kuwahara, Hiroshi, 4,107,754, Cl. 361-120.000.

Kuznetzoff, Philip: *See*—
James, Edward Anthony; and Kuznetzoff, Philip, 4,107,351, Cl. 427-43.000.

Kvita, Vratislav: *See*—
Baumann, Marcus; Kvita, Vratislav; Roth, Martin; and Waterhouse, John Sidney, 4,107,174, Cl. 260-326.0NS.

Labaugh, Kenneth D.: *See*—
Chicklis, Evan P.; Naiman, Charles S.; and Labaugh, Kenneth D., 4,107,529, Cl. 250-339.000.

Label-Aire Inc.: *See*—
Caudill, Donald L., 4,106,972, Cl. 156-363.000.

Labofina S.A.: *See*—
Debande, Guy F. S.; Cahen, Raymond N. M.; and Grootjans, Jacques F. J., 4,107,225, Cl. 260-683.900.
Leplat-Gryspeerdt, Paul A., 4,106,908, Cl. 23-230.0PC.

Laboratories Cassenne: *See*—
Hercelin, Bernard; and Hamon, Jean-Francois, 4,107,333, Cl. 424-365.000.

Labyer, Harold S.: *See*—
Dodson, James C.; and Labyer, Harold S., 4,106,393, Cl. 92-168.000.

Lac-Mac Limited: *See*—
Zurbrigg, Charles Edward; and Keenan, William Douglas Sulman, 4,106,120, Cl. 2-51.000.

Lachowicz, Donald R.; and Holder, Charles B., to Texaco Inc. Graft copolymer coated reinforcing agents. 4,107,110, Cl. 260-17.4CL.

Lafon, Victor. Cyclic phenylsulphinyl-amidine derivatives. 4,107,438, Cl. 548-353.000.

LaFountaine, Leonard Howard. Swimming pool construction. 4,106,246, Cl. 52-169.700.

Lagasse, Alain: *See*—
Violland, Robert; and Lagasse, Alain, 4,107,056, Cl. 252-8.800.

Lagerdahl, Sebastian, to Aktiebolaget Svenska Flaktfabriken. Arrangement in emitting electrodes for electrostatic precipitators. 4,106,919, Cl. 55-147.000.

Lai, Chi Sun; and Gunderson, Philip D., to Motorola, Inc. Electronic spark timing adjustment circuit. 4,106,440, Cl. 123-117.00R.

Laidlaw, Alan James: *See*—
Smith, Geoffrey Allan; and Laidlaw, Alan James, 4,106,895, Cl. 8-2.50A.

Laing, Nikolaus. Tube for fluid substances under pressure. 4,106,528, Cl. 138-149.000.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See*—
Izumi, Sachio; and Kotani, Tamotsu, 4,107,508, Cl. 219-137.700.
Schultz, Jean-Pierre; Cuny, Francis; Payraudeau, Daniel; and Tritz, Jean-Marie, 4,107,507, Cl. 219-121.00P.

Lam, Gow T.: *See*—
Morton, Harry E.; and Lam, Gow T., 4,107,287, Cl. 424-8.000.

Lamb, W. C.: *See*—
DeKerlegand, Deke E., 4,106,347, Cl. 73-622.000.

Lambert Brake Corporation: *See*—
Morgan, George H., 4,106,291, Cl. 60-369.000.

Landoni, Giannino, to MECA S.n.c. Apparatus for controlling the movement of a fabric-supporting carriage in a quilting machine. 4,106,417, Cl. 112-119.000.

Lane, Ernest: *See*—
Carpentier, Alain F.; and Lane, Ernest, 4,106,129, Cl. 3-1.500.

Lane, Thomas H.: *See*—
Frye, Cecil L.; and Lane, Thomas H., 4,107,196, Cl. 260-448.20N.

Lang, Richard L.; and Quaas, Dietmar G., to Buhrke Industries, Inc. High speed transfer mechanism for transfer die. 4,106,633, Cl. 214-1.0BB.

Langen, Hans; Ranz, Erwin; Eibl, Johannes; and Wolf, Walther, to AGFA-Gevaert, A.G. Light-sensitive material containing emulsified substances. 4,106,940, Cl. 96-74.000.

Langer, Arthur W., Jr.: *See*—
Roper, Robert; and Langer, Arthur W., Jr., 4,107,238, Cl. 260-880.00R.

Langheinrich, Klaus; Berenstecher, Otto; and Renziehausen, Horst, to Bayer Aktiengesellschaft. Process for the treatment of cellulose-fibres. 4,106,903, Cl. 8-196.000.

Langhurst, Arling K.: *See*—
Randall, James R.; Langhurst, Arling K.; Schopmeyer, Herman H.; and Seaton, Robert L., 4,106,487, Cl. 127-23.000.

Lannan, Patrick Edward: *See*—
Thornton, David Charles; Lightner, Linn Stephen; and Lannan, Patrick Edward, 4,106,523, Cl. 137-614.040.

Lannen Tehtaat OY: *See*—
Hakli, Reijo Sakari, 4,106,415, Cl. 111-3.000.

Lapp, Ellsworth W. Device for absorbing shock in a cable. 4,106,164, Cl. 24-16.00R.

Lapraik, Scott Jack: *See*—
Jayne, Max Leroy; Orbanic, Robert Stephen; and Lapraik, Scott Jack, 4,106,838, Cl. 339-99.00R.

Larsen, Johan M.: *See*—
Cowdery, Ray; and Larsen, Johan M., 4,106,151, Cl. 15-42.000.

Larsson, Ake Lennart, to Mattel, Inc. Escapement mechanism for watch. 4,106,282, Cl. 58-74.000.

Larsson, Erik Johan, to Barracudaverken AB. Inflatable floating bridge, laid out by inflating longitudinal hoses in the bridge. 4,106,149, Cl. 14-27.000.

Lasich, Lawrence E.: *See*—
Tecco, Charles; and Lasich, Lawrence E., 4,106,672, Cl. 222-151.000.

Lasorso, Vincent John, Jr.: *See*—
Spilman, Raymond; Haase, Edward Emil, Jr.; Kruger, Kurt John; Budnick, Donald Barry; and Lasorso, Vincent John, Jr., 4,106,490, Cl. 128-2.00F.

LaSpisa, Ronald J., to Phillips Petroleum Company. Extrusion control. 4,107,246, Cl. 264-40.700.

Lassiter, James W. Trans-horizon navigation system. 4,107,676, Cl. 343-6.50R.

Lather, Dieter; and Ries, Karl, to Mannesmann Aktiengesellschaft. Initialization and preparation of on-production-line ultrasonic test equipment. 4,106,326, Cl. 73-1.0DV.

Latta, Laurence, Jr.; and Leonard, John B., Jr. Epoxy resin soil stabilizing compositions. 4,107,112, Cl. 260-18.0EP.

Latta, Laurence, Jr.: *See*—
Leonard, John B., Jr.; and Latta, Laurence, Jr., 4,106,296, Cl. 61-36.00C.

Lauer, Richard E., to General Electric Company. Motor manufacturing method, system and method, system and components. 4,106,185, Cl. 29-596.000.

Laurence, Margaret M.: *See*—
Wilson, Porter C., 4,106,502, Cl. 128-145.800.

Lauro, Fernand, to Commissariat a l'Energie Atomique. Falling-film heat exchanger. 4,106,560, Cl. 165-159.000.

Lautrou, Jean: *See*—
Tilly, Guy; Hardouin, Michel Jean-Charles; and Lautrou, Jean, 4,107,286, Cl. 424-5.000.

Lavrova, Valentina Vasilievna: *See*—
Bondar, Petr Grigorievich; Goroshko, Oleg Nikolaevich; Suschaya, Larisa Emmanuilovna; Lavrova, Valentina Vasilievna; Leleka, Valentina Emmanuilovna; and Ilko, Eduard Grigorievich, 4,107,089, Cl. 252-465.000.

Law, Chi Y. Camera for taking three dimensional photographs having screen moving means. 4,107,712, Cl. 354-115.000.

Law, Chi Yin. Photographic camera for taking three dimensional photographs and method and apparatus for forming trivision images. 4,107,711, Cl. 354-112.000.

Lawn Doctor, Inc.: *See*—
Magda, Robert J., 4,106,703, Cl. 239-656.000.

Lawrence, George C., Jr. Vehicle roof ventilator insulation covering. 4,106,399, Cl. 98-2.140.

Lawrence, James L., Jr.; Holzl, Robert A.; and Pickett, Frederick P., to Analog Technology Corporation. Mandrel for formation of mass spectrometer filter. 4,106,744, Cl. 249-96.000.

Lawrence Peska Associates, Inc.: *See*—
Mannheim, Daniel I., 4,106,135, Cl. 4-247.000.

Lawrie, Alexander Murray: *See*—
Woodhouse, Eric Douglas; Lawrie, Alexander Murray; and McNeil, Thomas, 4,106,435, Cl. 118-301.000.

Lazar, Melvin E.: *See*—
Robertson, George H.; Lazar, Melvin E.; Krochta, John M.; Farkas, Daniel F.; and Bomben, John L., 4,107,340, Cl. 426-481.000.

Lea, Cyril: *See*—
Beard, James Henry; Lea, Cyril; and Ludwig, Bernard William, 4,106,177, Cl. 29-427.000.

Leary, Bruce: *See*—
Gibson, David Vincent; and Leary, Bruce, 4,107,113, Cl. 260-18.0PF.

Leclabart, Jacques, to Societe Anonyme Parfumerie et Chimieparchimy. Ampoule. 4,106,652, Cl. 215-253.000.

Leclerc, Real. Sofa bed. 4,106,137, Cl. 5-24.000.

Lee, B. Paul. Cooking utensil. 4,106,486, Cl. 126-369.000.

Lee, Joseph Y.: *See*—
D'Agostino, Vincent F.; Lee, Joseph Y.; and Cook, Edward H., Jr., 4,107,005, Cl. 204-98.000.

Lee, Larry E.: *See*—
West, Curtis W.; Lee, Larry E.; and Norris, Aubrey O., 4,106,581, Cl. 180-54.00B.

Lee, Michael Wayne, to Goodyear Tire & Rubber Company, The. Tire tread line stripping. 4,106,965, Cl. 156-123.00R.

Lee, Richard A., to United States of America, Army. Track guide mechanism. 4,106,822, Cl. 305-28.000.

Lee, Wai-Hon: *See*—
Bryngdahl, Olof; and Lee, Wai-Hon, 4,106,844, Cl. 350-6.200.

Leesona Corporation: *See*—
Kropa, Gomer E., 4,106,708, Cl. 241-222.000.

Leffingwell, Bruce, to MPB Corporation. Phenolic-acrylic fast-curing sealant system. 4,107,239, Cl. 260-881.000.

Lefrancier, Pierre, to Choay S.A. Process for making an octapeptide useful for the treatment of diabetes. 4,107,158, Cl. 260-112.50R.

Leggett & Platt, Incorporated: *See*—
Hooker, Joe Bryan, 4,106,141, Cl. 5-201.000.

Leighton, Howard N.: *See*—
Jacquart, Christian A.; Leighton, Howard N.; and Wilfinger, Raymond J., 4,107,550, Cl. 307-241.000.

Leland Stanford Junior University, The Board of Trustees of the: *See*—
Huang, Alan, 4,107,783, Cl. 364-746.000.

MaCovski, Albert, 4,107,532, Cl. 250-360.000.
Leleka, Valentina Emmanuilovna: *See*—
Bondar, Petr Grigorievich; Goroshko, Oleg Nikolaevich; Suschaya, Larisa Emmanuilovna; Lavrova, Valentina Vasilievna; Leleka, Valentina Emmanuilovna; and Ilko, Eduard Grigorievich, 4,107,089, Cl. 252-465.000.
Le Martret, Odile: *See*—
Allais, Andre; Clemence, Francois; Deraedt, Roger; and Le Martret, Odile, 4,107,310, Cl. 424-258.000.
Lemelson, Jerome H. Cleaning appliance. 4,106,153, Cl. 15-231.000.
Lemelson, Jerome H. Data generating and recording system for scanning a display tube screen. 4,107,741, Cl. 358-300.000.
Lemkin, Jack L., to Midland-Ross Corporation. Globe for lightbulbs. 4,107,768, Cl. 362-363.000.
Lemons, John B. Left and right handed child-resistant safety cap. 4,106,651, Cl. 215-221.000.
Lenk, Erich: *See*—
Schippers, Heinz; Lenk, Erich; Mayer, Manfred; Busch, Hans-Jochen; and Bremer, Hermann, 4,106,710, Cl. 242-18.00R.
Leonard, John B., Jr.; and Latta, Laurence, Jr. Method of soil stabilization. 4,106,296, Cl. 61-36.00C.
Leonard, John B., Jr: *See*—
Latta, Laurence, Jr.; and Leonard, John B., Jr, 4,107,112, Cl. 260-18.0EP.
Le Parmentier, Louis: *See*—
Auclair, Michel; and Le Parmentier, Louis, 4,106,287, Cl. 60-274.000.
Leplat-Gryspeerdt, Paul A., to Labofina S.A. Method for the determination of the organic carbon content in mineral-containing materials. 4,106,908, Cl. 23-230.0PC.
Leroy, Pierre; Maubon, Andre; and Saleil, Jean, to Creusot-Loire Enterprises. Converters for refining metals. 4,106,758, Cl. 266-158.000.
Lescouflair, Guy: *See*—
Charlebois, Jacques; and Lescouflair, Guy, 4,107,465, Cl. 179-1.00N.
Lesher, George Y.; and Opalka, Chester J., Jr., to Sterling Drug Inc. 5-(Pyridinyl)-2(1H)-pyridinones. 4,107,315, Cl. 424-263.000.
Letot, Incorporated: *See*—
Churchill, Steven T., 4,107,466, Cl. 179-2.00A.
Leu, Robert F.: *See*—
McCandless, William; Leu, Robert F.; Kroder, Ernest A.; and Tomecek, Charles J., 4,106,242, Cl. 51-225.000.
Levendusky, Jospeh A., to Epicor, Inc. Method of and apparatus for purifying fluids with radioactive impurities. 4,107,044, Cl. 210-266.000.
Leveque, J. Howard, to Frederick Electronics Corporation. Phase locked loop exciter generator for high frequency transmitter. 4,107,612, Cl. 325-171.000.
Levy, Ralph M., to Honeywell Inc. Cartridge fuse injector and ejector. 4,107,639, Cl. 337-205.000.
Levy, Richard H.: *See*—
Forsen, Harold K.; Janes, George Sargent; and Levy, Richard H., 4,107,537, Cl. 250-423.00P.
Levy, Sidney. Method and apparatus for recording graphic information magnetically. 4,107,742, Cl. 358-301.000.
Lewis, D. Kent: *See*—
Adler, Laszlo; Von Cook, K.; Simpson, William A., Jr.; and Lewis, D. Kent, 4,106,327, Cl. 73-1.0DV.
Lewis, Donald J.; and Jankowski, Albert J., to Allied Chemical Corporation. Seat belt system with starter engine lock and alarm. 4,107,645, Cl. 340-52.00E.
Lewis, Roger N.: *See*—
Friedman, Ronald L., deceased; and Lewis, Roger N., 4,107,419, Cl. 526-228.000.
Li, George S., to Standard Oil Company, The. Rubber-modified acrylonitrile-styrene-indene interpolymers. 4,107,237, Cl. 260-880.00R.
Libbey-Owens-Ford Company: *See*—
Gulish, William P., Jr., 4,106,683, Cl. 225-103.000.
Licentia Patent-Verwaltungs-G.m.b.H.: *See*—
Ruf, Herbert; Deml, Dieter; and Schwarz, Werner, 4,107,574, Cl. 315-3.500.
Liebman, Arnold A.; and Liu, Yu-Ying, to Hoffmann-La Roche Inc. 7-Oxo-9-methoxy-7H-furo[3,2-g][1]benzopyran-6-carboxylic acid. 4,107,182, Cl. 260-343.210.
Light, Kenneth K.; Vock, Manfred Hugo; Shuster, Edward J.; and Schmitt, Frederick Louis, to International Flavors & Fragrances Inc. 3,3-Dimethyl 2(3-butenyl) norbornanol-2 perfume compositions. 4,107,094, Cl. 252-522.000.
Lightner, Linn Stephen: *See*—
Thornton, David Charles; Lightner, Linn Stephen; and Lannan, Patrick Edward, 4,106,523, Cl. 137-614.040.
Liljenwall, Edward T.: *See*—
Helmso, Bennie E.; Holden, Thomas E.; and Liljenwall, Edward T., 4,106,677, Cl. 224-5.00A.
Lin, A. Oscar, to Yorker Research Corporation. Personal automatic vaporizer. 4,106,698, Cl. 239-34.000.
Lin, Kingso C.; and Hammond, Donald J., to Owens-Corning Fiberglas Corporation. Tire cord impregnant. 4,107,117, Cl. 260-28.50B.
Lin, Yang-i: *See*—
Goldman, Leon; Lin, Yang-i; and Marsico, Joseph William, Jr., 4,107,326, Cl. 424-304.000.
Lindberg, Jarl Johan; Turunen, Johannes; and Hortling, Bo, to Rauma-Repola Oy. Polymer made of lignin, and method for making it. 4,107,111, Cl. 260-17.500.
Lindblad, David A.: *See*—
Schmitt, Joseph J.; Dahlen, Richard R.; and Lindblad, David A., 4,106,905, Cl. 21-60.50R.
Linde Aktiengesellschaft: *See*—
Asztalos, Stefan; Stephan, Alfred; and Mayer, Reinhold, 4,106,796, Cl. 285-133.00R.
Lindenberg, Hans-Georg; and Golz, Hans-Joachim, to Varta Batterie Aktiengesellschaft. Gas removal means for storage batteries. 4,107,398, Cl. 429-88.000.
Lindsay, Edward R., Jr.; and Meginniss, Stephen Mason, III, to Extracorporeal Medical Systems, Inc. Dialysate preparation system. 4,107,039, Cl. 210-90.000.
Lindsay, Fredrick H. Mobile building floor joist assembly. 4,106,258, Cl. 52-693.000.
Linne, Robert Steven, to Southwire Company. Apparatus for hot-rolling non-ferrous metals. 4,106,319, Cl. 72-234.000.
Linzey, Raynor: *See*—
Shirn, George A.; Linzey, Raynor; and Cushenette, Carol A., 4,107,758, Cl. 361-275.000.
Lion Fat and Oil Company Limited, The: *See*—
Taniyasu, Ryozo; Kurokawa, Hideo; and Saito, Takeshi, 4,107,080, Cl. 252-431.00C.
Lion Hamigaki Kabushiki Kaisha: *See*—
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Lipp, Alfred: *See*—
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Lippincott, Richard L., Sr. Toilet flush flow accelerator. 4,106,136, Cl. 4-368.000.
Litton Industrial Products, Inc.: *See*—
Gurdak, Felix J.; and Cook, Francis W., Jr., 4,106,375, Cl. 82-21.00B.
Litton Systems, Inc.: *See*—
Bodine, Richard Hill, Jr.; and Rosiak, Marion, 4,107,579, Cl. 315-205.000.
Liu, Kang-Jen: *See*—
Chlanda, Frederick P.; Nagasubramanian, Krishnamurthy; and Liu, Kang-Jen, 4,107,015, Cl. 204-180.00P.
Nagasubramanian, Krishnamurthy; and Liu, Kang-Jen, 4,107,264, Cl. 423-81.000.
Liu, William Chang; Bratton, Francis H., deceased (by Bratton, Jean C., executrix); and Nali, Robert Ronald, to Brunswick Corporation. Method of making a cross linked pile product. 4,107,259, Cl. 264-331.000.
Liu, Yu-Ying: *See*—
Liebman, Arnold A.; and Liu, Yu-Ying, 4,107,182, Cl. 260-343.210.
Lloyd, Wayne B.; and Logan, Dale R., to Westinghouse Electric Corp. Airborne vibration isolated sensor apparatus. 4,106,740, Cl. 248-358.00R.
Lockheed Aircraft Corporation: *See*—
Brumfield, Elvin S.; Kutzscher, Edgar W.; and Lovelady, James N., 4,107,530, Cl. 250-342.000.
Loeffler, Karl H.: *See*—
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Logan, Arthur D.; and Rush, James B., to Dayco Corporation. Hose construction and method of making same. 4,106,967, Cl. 156-184.000.
Logan, Dale R.: *See*—
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Long, Alan Gibson: *See*—
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Long, Alfred D.: *See*—
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Longi, Paolo: *See*—
Giannini, Umberto; Cassata, Antonio; Longi, Paolo; and Mazzocchi, Romano, 4,107,413, Cl. 526-114.000.
Giannini, Umberto; Cassata, Antonio; Longi, Paolo; and Mazzocchi, Romano, 4,107,414, Cl. 526-114.000.
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Longman, Sidney E. Sugar cane planting machines. 4,106,669, Cl. 221-217.000.
Lonsdale, Melvin J.: *See*—
Batterton, Elmo L.; and Lonsdale, Melvin J., 4,106,212, Cl. 34-65.000.
Lords III Research & Development Co.: *See*—
Tarran, Phil Keith, 4,106,590, Cl. 182-20.000.
L'Oreal: *See*—
Jacquet, Bernard; Papantoniou, Christos; Dufaure, Pierre; and Mahieu, Claude, 4,107,290, Cl. 424-47.000.
Lorentzen, Alan P., to Bucheck, David J.; and Minnesota Mining and Manufacturing Company. Oil sorbing mat. 4,107,051, Cl. 210-500.00R.
Lorenz, Gordon Ronald, to Canada, Her Majesty the Queen in right of, as represented by the Minister of Energy, Mines and Resources; Her Majesty the Queen in right of the Province of Alberta, Government of the Province of Alberta, Department of Energy and Natural Resources, Alberta Syncrude Equity; Ontario Energy Corporation; Imperial Oil Limited; Canada-Cities Service, Ltd.; and Gulf Oil Canada Limited. Dual control system for tailings outlet of primary separation vessel in the hot water process for bituminuous sands. 4,107,029, Cl. 208-11.0LE.

Lorenz, Max R.: *See*—
Chiou, Charles; Galli, Guido; Loeffler, Karl H.; and Lorenz, Max R., 4,106,976, Cl. 156-644.000.
Lorenz, Roman R.; and Thielking, William H., to Sterling Drug Inc. Alkyl α-[3-(pyridyl)-anilinomethylene]acetoacetates. 4,107,167, Cl. 260-295.00R.
Lorenz, Ronald N.: *See*—
Pearson, Allen F.; Mayo, Paul A.; and Lorenz, Ronald N., 4,107,777, Cl. 364-465.000.
Loriers, Jean: *See*—
Percheron born Guegen, Annick; Achard, Jean Claude; Loriers, Jean; Bonnemay, Maurice; Bronoel, Guy; Sarradin, Joel; and Schlapbach, Louis, 4,107,405, Cl. 429-218.000.
Losert, Miloslav: *See*—
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Lourdes Industries, Inc.: *See*—
Jakobsen, William, 4,107,454, Cl. 174-135.000.
Loutfy, Raouf O.; and Ho, Paul P. K., to Noranda Mines Limited. Stable electrode for electrochemical applications. 4,107,025, Cl. 204-290.00F.
Lovejoy, Elwyn Raymond, to Du Pont de Nemours, E. I., and Company. Crosslinked aromatic polyimides and articles made therefrom. 4,107,125, Cl. 260-37.00N.
Lovejoy, George C.: *See*—
Owen, William S., Jr.; and Lovejoy, George C., 4,106,377, Cl. 83-4.000.
Lovelady, James N.: *See*—
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Low, Lothar: *See*—
Fitzner, Josef; and Low, Lothar, 4,106,275, Cl. 57-77.330.
Lowe, Colin F. Frameless metal building. 4,106,245, Cl. 52-90.000.
Lowry, John D.; and Holland, Kenneth F., to Image Transform, Inc. Noise reduction system for video signals. 4,107,736, Cl. 358-36.000.
Lowth, Leonard Cecil, to Scholl Inc. Article of wearing apparel providing an undergarment. 4,106,514, Cl. 128-519.000.
Lozio, Battista, to Lozio Battista e Figli S.p.A. Self-locking band. 4,106,802, Cl. 292-320.000.
Lozio Battista e Figli S.p.A.: *See*—
Lozio, Battista, 4,106,802, Cl. 292-320.000.
Luc, Penelope Jane Vesey. Frictional method and machine for seaming tubular sections. 4,106,167, Cl. 29-33.00D.
Lucas Electrical Limited: *See*—
Hill, William Frank; and Nicol, Thomas, 4,107,658, Cl. 340-620.000.
Lucas, Gareth Douglas. Knee brace. 4,106,143, Cl. 9-1.700.
Ludwig, Bernard William: *See*—
Beard, James Henry; Lea, Cyril; and Ludwig, Bernard William, 4,106,177, Cl. 29-427.000.
Ludwig Riedhammer GmbH & Co. K.G.: *See*—
Baumann, Helmut; and Petzi, Fritz, 4,106,893, Cl. 432-77.000.
Lueders, Robert E.; Kust, Roger N.; and Davies, David S., to Kennecott Copper Corporation. Cuprion process start-up control. 4,107,262, Cl. 423-32.000.
Luke, Perry J.; Machamer, James L.; and Becraft, William A., to Johns Hopkins University, The. Error correction encoder and decoder. 4,107,650, Cl. 340-146.1AL.
Lummus Company, The: *See*—
Sze, Morgan C.; Riegel, Herbert; and Schindler, Harvey D., 4,107,222, Cl. 260-659.00A.
Lund, George Edward: *See*—
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Allen, William W.; Sweeney, Charles E.; Lundquist, Alvin G., Jr.; and Hersh, Raymond T., 4,106,227, Cl. 38-143.000.
Lundy, Richard W., to J. I. Case Company. Fly and jib assembly for crane. 4,106,631, Cl. 212-144.000.
Luning, Bjorn Erik Gustav Bertilsson, to AB Bonnierforetagen. Antigenically active polypeptide and a process for its preparation. 4,107,298, Cl. 424-177.000.
Luria, Norman G.: *See*—
Schuster, Robert M.; and Luria, Norman G., 4,107,456, Cl. 174-151.000.
Lynch, John H.; and Gallegos, George L. Alarm communications system. 4,107,464, Cl. 179-1.00B.
Lynott, John Joseph, to International Business Machines Corporation. Apparatus and method for conducting financial transactions. 4,106,667, Cl. 221-1.000.
Lyon, Floyd A.; and Harrison, Henry, to Halm Instrument Co., Inc. Reflective solar heat collector. 4,106,480, Cl. 126-270.000.
Lyon, Richard H.: *See*—
Moore, James A.; and Lyon, Richard H., 4,106,588, Cl. 181-284.000.
M. Cohen & Sons, Inc.: *See*—
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M. L. Engineering (Plymouth) Limited: *See*—
Moorey, Ernest James, 4,107,616, Cl. 328-110.000.
M&T Chemicals Inc.: *See*—
Keller, Alfred A.; Russo, Robert V.; and Treadwell, Kenneth, 4,107,069, Cl. 252-182.000.
Maari, Roger, to Single Buoy Moorings Inc. Connecting arrangement between a floating structure and an anchor. 4,106,146, Cl. 9-8.00P.
Maben, James W., to Sanders Associates, Inc. Synchronization signal powered television transmitter. 4,107,737, Cl. 358-93.000.
MacDonald, Ira A.; and Egan, Richard R., to Ashland Oil, Inc. Particulate dehydrated potatoes with mono- and ethoxylated glycerides. 4,107,345, Cl. 426-637.000.
MacGovern, Alan J.: *See*—
Sprague, Robert A.; and MacGovern, Alan J., 4,107,701, Cl. 346-108.000.
Machamer, James L.: *See*—
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Machlett Laboratories, Inc., The: *See*—
Koller, Thomas J.; and Randmer, Jacob A., 4,107,562, Cl. 313-59.000.
Maciaszek, Joseph A., to Nalco Chemical Company. Pulp and papermaking additive. 4,107,073, Cl. 252-321.000.
MacNiel, Douglas K., to Master Specialties Company. Low level light indicator. 4,106,231, Cl. 40-547.000.
MaCovski, Albert, to Leland Stanford Junior University, The Board of Trustees of the. Orthogonal scan computerized tomography. 4,107,532, Cl. 250-360.000.
Madsen, Leonard P.: *See*—
Brower, Loyd R., Jr.; Madsen, Leonard P.; Zutaut, Chesly L.; and Barden, Walter M., Jr., 4,107,016, Cl. 204-181.00R.
Maeda, Kenji: *See*—
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Maffrand, Jean-Pierre; and Pereillo, Jean-Marie, to PARCOR. 2,3-Dihydrobenzofurans. 4,107,437, Cl. 544-376.000.
Magda, Robert J., to Lawn Doctor, Inc. Compact lawn spreader capable of mixing and widely spreading multiple lawn treatment materials. 4,106,703, Cl. 239-656.000.
Magney, Herbert C.: *See*—
Brimmer, Frances M.; Ahrens, Edward W.; and Magney, Herbert C., 4,106,620, Cl. 206-363.000.
Magnusson, Alan B.: *See*—
Dieck, Ronald L.; Magnusson, Alan B.; and Quinn, Edwin J., 4,107,146, Cl. 528-168.000.
Maher, James C.: *See*—
Conwell, Esther M.; Kermisch, Dorian; Maher, James C.; Pfister, Gustav R.; and Schank, Richard L., 4,106,848, Cl. 350-96.140.
Maher, John P.: *See*—
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Shirn, George A.; and Maher, John P., 4,107,762, Cl. 361-433.000.
Mahieu, Claude: *See*—
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Mailey, Everett A.: *See*—
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Mair, Alex C., to General Motors Corporation. Molding attachment for vehicle body. 4,106,803, Cl. 293-62.000.
Malacheski, Joseph J.; and Stelmack, Edward A. Valve construction. 4,106,747, Cl. 251-84.000.
Malden, Peter James, to English Clays Lovering Pochin & Company, Limited. Treatment of clay mineral pigment. 4,106,949, Cl. 106-288.00B.
Maler, Josef; Fischer, Evzen; Losert, Miloslav; and Kopecny, Miroslav, to Elitex, Koncern textilniho strojirenstvi. Method and apparatus for selecting needles in a circular knitting machine. 4,106,312, Cl. 66-50.00R.
Malhotra, Satish Chandra, to Du Pont de Nemours, E. I., and Company. Product and process for reducing discoloration and dark spotting in tetrafluoroethylene resin molded parts. 4,107,194, Cl. 260-42.180.
Mandel, Alan F.: *See*—
Otto, Paul R.; and Mandel, Alan F., 4,106,593, Cl. 187-29.00R.
Manesse, Jean-Pierre Andre, to Poclain, Societe Anonyme. Pressure relief valve. 4,106,522, Cl. 137-512.000.
Mangaraj, Duryodham: *See*—
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Manna, Albert, to Caterpillar Tractor Co. Indexed and coworking gears. 4,106,360, Cl. 74-440.000.
Mannesmann Aktiengesellschaft: *See*—
Altenbokum, Karlheinz; Goldschmidt, Rolf; Hansgen, Klaus; Hiersig, Heinz M.; and Szynka, Peter, 4,106,366, Cl. 74-801.000.
Lather, Dieter; and Ries, Karl, 4,106,326, Cl. 73-1.0DV.
Mannheim, Daniel I., to Lawrence Peska Associates, Inc. Water closet basin assembly. 4,106,135, Cl. 4-247.000.
Manning, William Patrick: *See*—
Ferrin, Charles Robert; and Manning, William Patrick, 4,107,270, Cl. 423-226.000.
Manska, Wayne E., to Moody, Ronald R.; and Manska, Wayne E. Non-rebounding article. 4,106,769, Cl. 273-58.00B.
Maquet, Joseph Andre: *See*—
Bourguignon, Guy Clement; and Maquet, Joseph Andre, 4,107,378, Cl. 428-323.000.
Mar-Kal Products Corporation: *See*—
Schmid, Hans F., 4,106,229, Cl. 40-611.000.
Marangoni, Roy D.; and Austin, Harry W., to Mine Safety Appliances Company. Energy absorbing suspension element. 4,106,127, Cl. 2-416.000.
Marcatili, Enrique Alfredo Jose, to Bell Telephone Laboratories, Incor-

porated. Optical fiber with graded index core and pure silica cladding. 4,106,850, Cl. 350-96.310.
Marcelli, Aline, to Societe Francaise pour le Developpement de l'Automatisme en Biologie. Device for examining a plurality of microdoses of liquids. 4,106,911, Cl. 23-259.000.
Marchessaux, Philippe: *See*—
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Marchioro, Ignazio: *See*—
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Marconi Company Limited, The: *See*—
Smith, Brian Roger; Jarvis, Charles Richard; Payne, Stephen Martin; Potts, Robert John; and Wallis, Frank, 4,106,187, Cl. 29-625.000.
Marconi Instruments Ltd.: *See*—
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Marine Moisture Control Company, Inc.: *See*—
Gravert, William H., 4,106,541, Cl. 151-48.000.
Marino, Francis C., to Burroughs Corporation. Raster scanned display system. 4,107,664, Cl. 340-324.0AD.
Mark, Victor; and Hedges, Charles Vernon, to General Electric Company. Process for purifying impure diphenols. 4,107,443, Cl. 568-750.000.
Marker, Harry Rudolph, to Electronic Engineering Co. of California. Rotary rocking-beam switch. 4,107,482, Cl. 200-6.00B.
Markussen, Erik Kjaer; and Schmidt, Arne Wintherhalter, to Novo Industri A/S. Enzyme granulate composition and process for forming enzyme granulates. 4,106,991, Cl. 195-63.000.
Marley, Clement F. Full-season rain gauge having replaceable charts for making profile graphs. 4,106,336, Cl. 73-171.000.
Marola, Americo Edward; and Stella, Leo, to Torrington Company, The. Bearing with lubricating system. 4,106,826, Cl. 308-187.000.
Marquette Metal Products Co.: *See*—
Anderson, J. Edward C., 4,106,572, Cl. 173-93.000.
Mars, Incorporated: *See*—
Heiman, Frederic P., 4,106,610, Cl. 194-97.00R.
Marsden, Charles P., Jr., to United States of America, Army. Rugged quick-heating electron tubes. 4,107,566, Cl. 313-293.000.
Marsden, John, to Halter Marine Services, Inc. Apparatus for and method of loading loose granular material from barges into ships. 4,106,637, Cl. 214-13.000.
Marsh, Dana G., to Xerox Corporation. Microimaging film containing an organic diselenide, a tertiary phosphine or phosphite and an azo organic peroxide and the use thereof. 4,106,936, Cl. 96-27.00R.
Marsh, David John: *See*—
Bunton, John Darrah; and Marsh, David John, 4,106,331, Cl. 73-61.10R.
Marshall, Vincent P.; Elrod, David W.; Koert, James M.; Reisender, Elizabeth A.; and Wiley, Paul F., to Upjohn Company, The. Process for producing steffimycinol. 4,106,994, Cl. 195-80.00R.
Marsico, Joseph William, Jr.: *See*—
Goldman, Leon; Lin, Yang-i; and Marsico, Joseph William, Jr., 4,107,326, Cl. 424-304.000.
Marten, Wolfgang; Holstein, Herbert; and Esser, Gustav, to Oswald Forst Maschinenfabrik und Apparatebauanstalt GmbH. Workpiece holder for a vertical broaching machine for broaching annular workpieces. 4,106,785, Cl. 279-4.000.
Martin, Charles Andrew: *See*—
Klisch, Stephen Cajetan; and Martin, Charles Andrew, 4,107,095, Cl. 252-541.000.
Martin, Elmore Louis, to Du Pont de Nemours, E. I., and Company. Thermally stable, rigid, aliphatic diols. 4,107,444, Cl. 568-807.000.
Martin, Jean-Claude; and Piguet, Christian, to Centre Electronique Horloger S.A. Wrist watch incorporating a thermoelectric generator. 4,106,279, Cl. 58-23.0BA.
Martin, Kenneth W. Device to strengthen muscles. 4,106,489, Cl. 128-1.00R.
Martin Marietta Corporation: *See*—
Borcher, Charles A.; and Porter, William R., 4,106,410, Cl. 102-67.000.
Borcher, Charles A.; Porter, William R.; and Harris, Martin H., 4,106,411, Cl. 102-67.000.
Coon, Bryan H., 4,106,855, Cl. 350-196.000.
Emmons, David L.; Roberts, Richard E.; Pasko, Edward; and Harmon, George Lamar, 4,106,726, Cl. 244-3.170.
Martin, Walter J.; and Furtado, John, to Raytheon Company. Beam forming system. 4,107,685, Cl. 343-100.0SA.
Martin, William Donald, to Hewlett-Packard Company. Glitch detector. 4,107,651, Cl. 340-146.10R.
Martinaud, Jacques-Pierre: *See*—
Chevallier, Yvonick; Martinaud, Jacques-Pierre; Meiller, Francois; and Berthoux, Jean, 4,107,079, Cl. 252-429.00R.
Martinelli, Luciano B. Tearable bottle cap. 4,106,653, Cl. 215-256.000.
Martinez, Eugene E., to Reikel, Robert H. Photo album. 4,106,230, Cl. 40-158.00R.
Martinez, Jose M.: *See*—
Meuschke, Robert E.; and Martinez, Jose M., 4,106,983, Cl. 176-19.00R.
Martorano, Richard: *See*—
Haag, Thomas H.; Brendley, William H., Jr.; and Martorano, Richard, 4,106,421, Cl. 113-120.00A.
Marty, Jennifer Joy: *See*—
Oppenheim, Richard Charles; Marty, Jennifer Joy; and Speiser, Peter, 4,107,288, Cl. 424-22.000.
Maruta, Rikio, to Nippon Electric Co., Ltd. Digital SSB-FDM communication system derived from a complex band-pass digital filter bank and by a filter breakdown process. 4,107,470, Cl. 179-15.0FS.
Marvin Glass & Associates: *See*—
Morrison, Howard J., 4,107,477, Cl. 179-99.000
Maryland Cup Corporation: *See*—
Boyle, Patrick T., 4,106,660, Cl. 220-90.400.
Masaki, Katsumi; and Isaka, Yukio Inagi., to Canon Kabushiki Kaisha. Character size changing device. 4,107,786, Cl. 364-900.000.
Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See*—
Vogel, Rudolf, 4,106,302, Cl. 61-94.000.
von Schnurbein, Eglof; Bucher, Jakob; and Mikota, Thomas, 4,106,289, Cl. 60-314.000.
Maschinenfabrik Buckau Aktiengesellschaft: *See*—
Buzga, Heinrich; Steprath, Werner; and Pause, Kurt, 4,106,518, Cl. 134-104.000.
Masi, James V., to UCE, Inc. Photovoltaic semiconductor device using an organic material as an active layer. 4,106,951, Cl. 136-89.0NB.
Mason, Stephen Howard: *See*—
Konrad, Frederick Miller; and Mason, Stephen Howard, 4,107,218, Cl. 560-724.000.
Massa, Donald P., to Dellorfano, Fred M., Jr.; and Massa, Donald P., Trustees of The Stoneleigh Trust. Intrusion alarm system with improved air turbulence compensation. 4,107,659, Cl. 340-552.000.
Massachusetts Institute of Technology: *See*—
Kildal, Helge; and Brueck, Steven R. J., 4,107,544, Cl. 307-88.300.
Moore, James A.; and Lyon, Richard H., 4,106,588, Cl. 181-284.000.
Massey-Ferguson Services N.V.: *See*—
Williams, Derek Geoffrey, 4,106,644, Cl. 214-138.00C.
Master Specialties Company: *See*—
MacNiel, Douglas K., 4,106,231, Cl. 40-547.000.
Masuda, Kenzo: *See*—
Sakaba, Hiroo; and Masuda, Kenzo, 4,107,548, Cl. 307-205.000.
Masuda, Mitsuo: *See*—
Kodaira, Hiroshi; and Masuda, Mitsuo, 4,106,390, Cl. 91-42.000.
Masuda, Senichi; and Hirai, Junji, to Masuda, Senichi. Pulse power source. 4,107,757, Cl. 361-235.000.
Matejczyk, Mary-Blair: *See*—
Greenwald, A. Seth; Porritt, Derek S.; and Matejczyk, Mary-Blair, 4,106,128, Cl. 3-1.910.
Mateshin, Vasily Gerasimovich: *See*—
Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pirogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Borisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; Shevtsov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich; Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mateshin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich; Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich; Koen, David Matveevich; Seleverstov, Vladimir Vasilievich; Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pizogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Bozisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zakharovich, 4,107,449, Cl. 13-35.000.
Mathieu, Hans; and Hochstrasser, Jurgen, to Hochstrasser nee Wack, Elizabeth; and Hochstrasser, Jurgen. Device for the production of earth holes. 4,106,298, Cl. 61-53.640.
Matoba, Kazuo: *See*—
Takao, Hiroshi; and Matoba, Kazuo, 4,107,019, Cl. 204-195.00S.
Matson Navigation Company: *See*—
Montgomery, Murray Mathews; Gilger, William Francis; and Steiner, William Winfield, 4,106,639, Cl. 214-14.000.
Matsubara, Hiroshi, to Diesel Kiki Co., Ltd. Vehicle speed control system. 4,106,584, Cl. 180-105.00E.
Matsubara, Hiroyoshi: *See*—
Koshiga, Fusao; Tanaka, Jinkichi; Watanabe, Itaru; Suzuki, Motoaki; Kojima, Toshifumi; Matsubara, Hiroyoshi; Osuka, Tatsumi; Takeshige, Kenji; Nagamine, Takashi; and Hirano, Osamu, 4,107,503, Cl. 219-61.000.
Matsuda, Hiroshi: *See*—
Takahashi, Yuzo; Tanaka, Yasuyuki; Nagai, Katsumi; Takahashi, Nobuo; Matsuda, Hiroshi; Ono, Koichi; Tanaka, Kozi; and Oyama, Shiro, 4,106,420, Cl. 113-12.000.
Matsuda, Itsuo: *See*—
Akiyama, Keiichi; Kamiuchi, Junichi; Matsuda, Itsuo; and Fujii, Takara, 4,107,153, Cl. 528-322.000.
Matsuda, Takayuki: *See*—
Nii, Yoshiji; Matsuda, Takayuki; Yamazaki, Yoichi; and Nohara, Haruo, 4,107,778, Cl. 364-492.000.
Matsuda, Toshiharu, to Hitachi, Ltd. Reverse-flow air conditioner. 4,106,307, Cl. 62-324.000.
Matsumoto, Hiromitsu: *See*—
Yamashita, Ryuichi; Matsumoto, Hiromitsu; and Eda, Masato, 4,106,464, Cl. 123-179.00A.
Matsumoto, Noboru; Kurose, Kunio; and Ueno, Kinya, to Toyota Jidosha Kogyo Kabushiki Kaisha. EGR system. 4,106,449, Cl. 123-119.00A.
Matsumura, Masaji: *See*—
Morimoto, Katsuhide; Matsumura, Masaji; Yamauchi, Nobuharu; Koyanagi, Haruo; Sato, Iwao; Yasuhara, Buhei; and Sakai, Jiro, 4,107,663, Cl. 340-324.0AD.

Matsunaga, Masaaki: *See*—
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Matsunaga, Yoshiki: *See*—
Kameyama, Akinori; Matsunaga, Yoshiki; and Saito, Hiroyasu, 4,107,119, Cl. 260-29.4UA.

Matsuno, Tadahiko: *See*—
Kono, Hiroshi; Kubo, Sueki; and Matsuno, Tadahiko, 4,106,760, Cl. 266-281.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Higashida, Yutaka, 4,106,724, Cl. 242-198.000.
Tanaka, Junzo; and Kai, Toshio, 4,107,502, Cl. 219-10.55F.

Matsuyama, Takeshi: *See*—
Yoshida, Takashi; and Matsuyama, Takeshi, 4,107,725, Cl. 357-41.000.

Mattchen, Terry M., to American Safety Equipment Corporation. Quick release mechanism for oscillating saw blade. 4,106,181, Cl. 29-450.00R.

Mattel, Inc.: *See*—
Larsson, Ake Lennart, 4,106,282, Cl. 58-74.000.

Matthiessen, Roy A. Safety shield for flange type coupling. 4,106,428, Cl. 116-114.00P.

Matumaru, Haruo: *See*—
Nakano, Toshio; Sasano, Akira; Tsutsui, Ken; and Matumaru, Haruo, 4,107,568, Cl. 313-371.000.

Matzuk, Terrance. Grey-level ultrasonic imaging. 4,106,346, Cl. 73-614.000.

Maubon, Andre: *See*—
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Maurer, Fritz: *See*—
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Hammann, Ingeborg; and Behrenz, Wolfgang, 4,107,301, Cl. 424-200.000.

Maurin, Jean: *See*—
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Max, Lee B., to Varian Associates, Inc. Package for push-pull semiconductor devices. 4,107,728, Cl. 357-80.000.

Maxey, Alexander R., to Arvin Industries, Inc. Variable ratio magnetic tape drive using a variable belt thickness. 4,107,744, Cl. 360-73.000.

Maxwell, David. Marker compass. 4,106,200, Cl. 33-27.00B.

May, Fred W., III: *See*—
Spitzer, Robert E.; and May, Fred W., III, 4,106,730, Cl. 244-183.000.

Mayer, Joseph; and Sherlock, Margaret H., to Schering Corporation. Certain amino naphthyridines. 4,107,166, Cl. 260-294.80C.

Mayer, Manfred: *See*—
Schippers, Heinz; Lenk, Erich; Mayer, Manfred; Busch, Hans-Jochen; and Bremer, Hermann, 4,106,710, Cl. 242-18.00R.

Mayer, Norbert; Pfahler, Gerhard; and Wiezer, Hartmut, to Hoechst Aktiengesellschaft. 1-Oxa-4,8-diazaspiro[4,5]decanes and polymers stabilized against UV light with these compounds. 4,107,139, Cl. 260-45.8NZ.

Mayer, Reinhold: *See*—
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Mayer, Steven T.; and Milner, Ronald E., to Atari, Inc. Apparatus for continuous variation of object size on a raster type video screen. 4,107,665, Cl. 340-324.0AD.

Mayes, Clell C. Draft air control system. 4,106,475, Cl. 126-121.000.

Mayhew, Raymond Leonard: *See*—
Tilson, Edward Arthur; and Mayhew, Raymond Leonard, 4,107,327, Cl. 428-304.000.

Mayo, Paul A.: *See*—
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Mazzocchi, Romano: *See*—
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Giannini, Umberto; Cassata, Antonio; Longi, Paolo; and Mazzocchi, Romano, 4,107,414, Cl. 526-114.000.
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MBI Corporation: *See*—
Koerner, Heinz Albrecht, 4,106,612, Cl. 198-479.000.

McCandless, William; Leu, Robert F.; Kroder, Ernest A.; and Tomecek, Charles J., to Dentsply Research & Development Corp. Workhead for an automatic bur grinding machine. 4,106,242, Cl. 51-225.000.

McCartney, Joseph F.: *See*—
Goodson, Forrest R.; Shipman, William H.; and McCartney, Joseph F., 4,107,401, Cl. 429-101.000.

McCord Corporation: *See*—
Scrivo, Jerry V., 4,106,804, Cl. 293-63.000.

McCord, James W. Ultrasonic cleaning apparatus. 4,107,790, Cl. 366-127.000.

McCoy, Richard Alan, to Owens-Corning Fiberglas Corporation. Size composition. 4,107,118, Cl. 260-29.2EP.

McCracken, Oliver W., to Otis Engineering Corporation. Pressure recorder with power conservation means. 4,107,697, Cl. 346-33.00R.

McCulloch, Reginald W.: *See*—
Morgan, Chester S., Jr.; Cavin, O. Burl; McCulloch, Reginald W.; and Clark, David L., 4,106,186, Cl. 29-616.000.

McDowell, Robert, to Kilgore, Bevil J.; and Backus, James H. Method and apparatus for uniformly pneumatically dispersing material. 4,107,789, Cl. 366-3.000.

McEachern, Robert A., to American Optical Corporation. Heart defibrillating and monitoring system. 4,106,494, Cl. 128-2.06B.

McEntire, Edward E.; and Gipson, Robert M., to Texaco Development Corp. Low foaming beta-amino propionic acid surface active agents. 4,107,096, Cl. 252-546.000.

McFadden, Arthur R.; and Helsley, Grover C., to American Hoechst Corporation. Benzyl and related esters of 6,11-dihydrodibenz[b,e]oxepin-acetic acids. 4,107,322, Cl. 424-278.000.

McFadden, Arthur Raymond; and Aultz, Daniel Eugene, to American Hoechst Corporation. Process for preparing heteroarylbenzoxepin-acetic acids, precursors and derivatives thereof. 4,107,177, Cl. 260-332.20C.

McFadden, Arthur Raymond; and Aultz, Daniel Eugene, to American Hoechst Corporation. Oxopyrrolobenzoxepin-acetic acids, precursors and derivatives thereof. 4,107,321, Cl. 424-274.000.

McGahren, William James: *See*—
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McGehee, Wendyl B. Fertilizer spreader box. 4,106,643, Cl. 214-83.360.

McGinniss, Vincent Daniel; Seidewand, Robert Joseph; and Erickson, James Robert, to SCM Corporation. Ultraviolet curable latexes. 4,107,013, Cl. 204-159.160.

McKenna, Maurice: *See*—
Currie, John Alexander; McKenna, Maurice; and Upton, John Howard, 4,106,525, Cl. 138-43.000.

McKeown, William L., to Textron, Inc. Recording monitor for structure faults. 4,106,332, Cl. 73-104.000.

McKinney, James C., to Creative Dispensing Systems, Inc. Inlet conduit fluid filter. 4,107,043, Cl. 210-232.000.

McKinney, James T.; and Rusch, Thomas W., to Minnesota Mining and Manufacturing Company. Ion scattering spectrometer with modified bias. 4,107,526, Cl. 250-305.000.

McLoughlin, Victor Conrad Richard; Moreton, Roger; and Watt, William, to National Research Development Corporation. Acrylonitrile copolymers for carbon fibers. 4,107,408, Cl. 526-8.000.

McMahon, David Gue: *See*—
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McMahon, Donald H., to Sperry Rand Corporation. Optical repeater. 4,107,518, Cl. 250-199.000.

McMannis, William Thomas, to General Electric Company. Adaptive frequency to digital converter system. 4,107,600, Cl. 324-78.00R.

McMillen, Kenneth Ray: *See*—
Weigand, Rex Olen; McMillen, Kenneth Ray; Fulk, Ronald Dean; Prichard, Daniel Ray; and Kountz, Jack Merriel, 4,106,270, Cl. 56-98.000.

McNeil, Thomas: *See*—
Woodhouse, Eric Douglas; Lawrie, Alexander Murray; and McNeil, Thomas, 4,106,435, Cl. 118-301.000.

McNeill, Charles T., to No-Joint Concrete Pipe Co. Method of making reinforced cast-in-place concrete pipe. 4,106,300, Cl. 61-72.200.

McRoskey, John W.; McRoskey, Leonard H.; and Swartz, Delbert D., to Republic Tool & Manufacturing Corp. Spreader (broadcast). 4,106,704, Cl. 239-685.000.

McRoskey, Leonard H.: *See*—
McRoskey, John W.; McRoskey, Leonard H.; and Swartz, Delbert D., 4,106,704, Cl. 239-685.000.

McTeague, Gerald E.; and Stinger, Kenneth R., to Tektronix, Inc.; and Tektronix, Inc. Cathode ray storage tube having a target dielectric provided with particulate segments of collector electrode extending therethrough. 4,106,937, Cl. 96-36.100.

McWhorter, Daniel M., to Kendall Company, The. Catheters. 4,106,509, Cl. 128-349.00B.

Mead Corporation, The: *See*—
Kenworthy, E. J. Doyle, 4,107,699, Cl. 346-75.000.

Meade, John E.: *See*—
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Meador, Richard A.; Adams, Larry L.; Cox, Percy T.; Thompson, Larry W.; and Fuchs, James A., to Texaco Inc. Electromagnetic wave propagation well logging utilizing multiple phase shift measurement. 4,107,597, Cl. 324-6.000.

Meador, Richard A.; Adams, Larry L.; Fuchs, James A.; Cox, Percy T.; and Thompson, Larry W., to Texaco Inc. Electromagnetic wave logging system for determining resistivity and dielectric constant of earth formations. 4,107,598, Cl. 324-6.000.

Measurex Corporation: *See*—
Typpo, Pekka Matti; and Wennerberg, Gunnar, 4,107,606, Cl. 324-229.000.

MECA S.n.c.: *See*—
Landoni, Giannino, 4,106,417, Cl. 112-119.000.

Medtronic, Inc.: *See*—
Bisping, Hans Jurgen, 4,106,512, Cl. 128-418.000.

Mefina S.A.: *See*—
Fresard, Marcel, 4,106,419, Cl. 112-158.00A.

Mega Analytical Research Services, Inc.: *See*—
Dame, Richard E., 4,106,484, Cl. 126-271.000.

Meginniss, Stephen Mason, III: *See*—
Lindsay, Edward R., Jr.; and Meginniss, Stephen Mason, III, 4,107,039, Cl. 210-90.000.

Meier, Joseph F.: *See*—
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Meiller, Francois: *See—*
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Meiners, Hans-Joachim: *See—*
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Hubner, Hans; Blahak, Johannes; and Meiners, Hans-Joachim, 4,107,152, Cl. 528-68.000.
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Melikova, Gayane Leonovna: *See—*
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Melocik, Grant C.: *See—*
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Memorex Corporation: *See—*
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Mendelsohn, Morris A.; Rosenblatt, Girard B., Jr.; and Meier, Joseph F., to Westinghouse Electric Corp. Process for the manufacture of a flame resistant, insulating, energy-absorbing, porous phenolic foam. 4,107,107, Cl. 521-106.000.
Menschik, Judith: *See—*
Paul, Rolf; and Menschik, Judith, 4,107,307, Cl. 424-249.000.
Paul, Rolf; and Menschik, Judith, 4,107,308, Cl. 424-249.000.
Paul, Rolf; and Menschik, Judith, 4,107,309, Cl. 424-249.000.
Mentz, Bernardus J., to Hooker Chemicals & Plastics Corporation. Filter press halate cell. 4,107,023, Cl. 204-269.000.
Merchant, Suresh; Winkler, Diethard; and Bluhm, Marita, to Dr. Kurt Herberts & Co. Gesellschaft Mit Mit Beschrankter Haftung Vorm. Otto Louis Becker. Process for the production of highly heat-resistant insulating coatings on electrical conductors. 4,107,355, Cl. 427-120.000.
Merck & Co., Inc.: *See—*
Christensen, Burton G.; Cama, Lovji D.; Karady, Sandor; and Sletzinger, Meyer, 4,107,432, Cl. 544-21.000.
Morse, Lewis D.; Boroshok, Melvin J.; and Grabner, Roy W., 4,107,072, Cl. 252-316.000.
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Fletcher, George Leland; and Merrill, Stewart H., 4,107,155, Cl. 528-373.000.
Mestdagh, Gilbert Edouard, to U.S. Philips Corporation. Cassette recorder with anti-erase interlock. 4,107,743, Cl. 360-60.000.
Metallgesellschaft Aktiengesellschaft: *See—*
von Ropenack, Adolf; Wiegand, Volker; and Smykalla, Gunter, 4,107,265, Cl. 423-101.000.
Metropolitan Wire Corporation: *See—*
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Metz, Werner A.: *See—*
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Metzger, Adolf: *See—*
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Metzger, Karl Georg: *See—*
Schrock, Wilfried; Konig, Hans-Bodo; Preiss, Michael; Metzger, Karl Georg; and Walkowiak, Michael, 4,107,304, Cl. 424-246.000.
Meuschke, Robert E.; and Martinez, Jose M., to Westinghouse Electric Corp. Thermocouple hot junction receptacle for a nuclear reactor. 4,106,983, Cl. 176-19.00R.
Meyer Morton Co.: *See—*
Batterton, Elmo L.; and Lonsdale, Melvin J., 4,106,212, Cl. 34-65.000.
Meyer, Robert R., to Monroe Auto Equipment Company. Method and apparatus for manufacturing combination shock absorbers and leveling struts. 4,106,175, Cl. 29-243.520.
Meyerand, Russell Gilbert, Jr.; Krascella, Nicholas Leo; and McMahon, David Gue, to United Technologies Corporation. Photo-electrolytic production of hydrogen. 4,107,010, Cl. 204-129.000.
Meystre, Noel; Christ, Alfred; and Miller, Helmut, to Escher Wyss Limited. Hydrostatic supporting device. 4,106,824, Cl. 308-9.000.
MFE Corporation: *See—*
Burke, Edward F., Jr., 4,107,745, Cl. 360-73.000.
Michael, Vesta F., to Fiber Glass Systems, Inc. Reinforced fitting construction. 4,106,797, Cl. 285-156.000.
Michaels, Edwin B. Antimicrobial compositions and methods for utilizing the same employing mixtures of amines. 4,107,328, Cl. 424-316.000.
Michalko, Edward, to UOP Inc. Catalytic composite and method of manufacture. 4,107,086, Cl. 252-455.00Z.
Michelson, Manfred G.: *See—*
Valliant, William W.; and Michelson, Manfred G., 4,106,686, Cl. 226-188.000.
Michurov, Jury Ivanovich: *See—*
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Micro Communications Corporation: *See—*
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Microdot, Inc.: *See—*
Myers, William D., 4,106,540, Cl. 151-14.0CS.
Midland-Ross Corporation: *See—*
Lemkin, Jack L., 4,107,768, Cl. 362-363.000.
Mihirogi, Kiyoshi, to Japan Air Lines, Co., Ltd. Current collecting system for vehicle. 4,106,600, Cl. 191-59.100.
Mikituk, Murray M., to General Signal Corporation. Locking system for blender jar or the like. 4,107,791, Cl. 366-205.000.
Mikota, Thomas: *See—*
von Schnurbein, Eglof; Bucher, Jakob; and Mikota, Thomas, 4,106,289, Cl. 60-314.000.
Miles, Brian Leslie: *See—*
Tombs, Terence Leslie; Miles, Brian Leslie; and Smith, Dexter William, 4,107,510, Cl. 219-270.000.
Millard, Paul Lance: *See—*
Cooper, Bryan Ewart; and Millard, Paul Lance, 4,106,948, Cl. 106-197.00R.
Miller, Albert J., to Engineering Systems Corporation. Device for increasing fuel economy of an internal combustion engine. 4,106,442, Cl. 123-26.000.
Miller, Charles E.: *See—*
Repik, Albert J.; Miller, Charles E.; and Johnson, Homer R., 4,107,084, Cl. 252-445.000.
Miller, David. Side burn trimming guide. 4,106,515, Cl. 132-45.00R.
Miller, Emil E.; and Miller, Stella Maye. Decorative plate mounting assembly. 4,106,742, Cl. 248-488.000.
Miller, Gabriel Lorimer, to Bell Telephone Laboratories, Incorporated. Phototransistor. 4,107,721, Cl. 357-30.000.
Miller, George T., to Hooker Chemicals & Plastics Corporation. Flame retardant cellulosic materials. 4,107,373, Cl. 428-264.000.
Miller, Gladys D.: *See—*
Renk, Richard John; and Boller, George Earl, 4,106,664, Cl. 220-329.000.
Miller, Helmut: *See—*
Meystre, Noel; Christ, Alfred; and Miller, Helmut, 4,106,824, Cl. 308-9.000.
Miller, Jerold R., to Dexter, Robert A., a part interest. Adjustable end wrench. 4,106,372, Cl. 81-143.000.
Miller, Jerome Freed, to Singer Company, The. Heating and cooling system with capillary control means. 4,106,308, Cl. 62-324.000.
Miller, Stella Maye: *See—*
Miller, Emil E.; and Miller, Stella Maye, 4,106,742, Cl. 248-488.000.
Mills, George A.: *See—*
Warkentin, Aaron J.; and Mills, George A., 4,106,628, Cl. 209-74.00M.
Milner, Ronald E.: *See—*
Mayer, Steven T.; and Milner, Ronald E., 4,107,665, Cl. 340-324.0AD.
Milton, William M.: *See—*
Fournier, Lawrence E.; Jasiewicz, Theodore M.; and Milton, William M., 4,106,184, Cl. 29-570.000.
Minagawa, Motonobu; Nakahara, Yutaka; and Haruna, Tohru, to Argus Chemical Corporation. Synthetic resin stabilizer comprising an organic phosphite and a carbonate. 4,107,136, Cl. 260-45.95C.
Minami, Norio: *See—*
Kijima, Shizumasa; Igarashi, Toshiji; Yamatsu, Isao; Hamamura, Kimio; Nakajima, Yoshikage; Minami, Norio; Yamagishi, Youji; and Inai, Yuithi, 4,107,193, Cl. 260-410.000.
Mine Safety Appliances Company: *See—*
Marangoni, Roy D.; and Austin, Harry W., 4,106,127, Cl. 2-416.000.
Minhas, Pritam Singh: *See—*
Sukornick, Bernard; Minhas, Pritam Singh; and Sweeney, Richard Francis, 4,107,055, Cl. 252-8.600.
Minka, Karlis. Convertible seat of a vehicle. 4,106,809, Cl. 296-69.000.
Minnesota Mining and Manufacturing Company: *See—*
Berg, Jack V., 4,106,195, Cl. 30-293.000.
Lorentzen, Alan P., 4,107,051, Cl. 210-500.00R.
McKinney, James T.; and Rusch, Thomas W., 4,107,526, Cl. 250-305.000.
Schmitt, Joseph J.; Dahlen, Richard R.; and Lindblad, David A., 4,106,905, Cl. 21-60.50R.
Taylor, Allen L., 4,106,933, Cl. 96-1.50R.
Minolta Camera Kabushiki Kaisha: *See—*
Tanaka, Harumi, 4,107,715, Cl. 354-206.000.
Tsujimoto, Kayoshi; and Yoshizaki, Akira, 4,107,709, Cl. 354-51.000.
Ueda, Hiroshi; and Tsujimoto, Kayoshi, 4,107,706, Cl. 354-31.000.
Misumi, Tadanori: *See—*
Fujikawa, Tomio; Funakoshi, Masayasu; and Misumi, Tadanori, 4,106,918, Cl. 55-71.000.
Mitsubishi Chemical Industries Limited: *See—*
Hirota, Tetsuya; Hishida, Tadashi; Kamata, Akira; Nakazawa, Isao; and Takamisawa, Hiroshi, 4,106,993, Cl. 195-65.000.
Mitsubishi Denki Kabushiki Kaisha: *See—*
Akamatsu, Masahiko, 4,107,551, Cl. 307-252.00J.
Akamatsu, Masahiko, 4,107,552, Cl. 307-252.00J.
Akiyoshi, Toshio; Onishi, Tsutomu; and Haikawa, Shozo, 4,106,371, Cl. 81-57.140.
Ishida, Yotsuo; and Kuwahara, Hiroshi, 4,107,754, Cl. 361-120.000.
Morimoto, Katsuhide; Matsumura, Masaji; Yamauchi, Nobuharu; Koyanagi, Haruo; Sato, Iwao; Yasuhara, Buhei; and Sakai, Jiro, 4,107,663, Cl. 340-324.0AD.

Uchida, Ryohei; Utsumi, Satoshi; and Akamatsu, Masahiko, 4,107,772, Cl. 363-124.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Atsukawa, Masumi; Shinoda, Naoharu; and Tanaka, Takeji, 4,107,271, Cl. 423-235.000.
Shimada, Hiroyuki; and Toyoda, Shozo, 4,106,303, Cl. 61-101.000.
Mitsubishi Petrochemical Company Limited: *See*—
Tamura, Noriyoshi; and Kihara, Kunio, 4,107,098, Cl. 521-25.000.
Mitsubishi Rayon Co., Ltd.: *See*—
Musha, Morito; and Miyamatsu, Tokuhisa, 4,107,384, Cl. 428-398.000.
Sunamori, Takashi; and Nishii, Noboru, 4,107,156, Cl. 526-91.000.
Mitsuboshi Sangyo Co., Ltd.: *See*—
Iwasaki, Hajime; and Tomita, Yasuo, 4,107,375, Cl. 428-291.000.
Mitsui Petrochemical Industries Ltd.: *See*—
Yatsu, Tadao; and Wakumoto, Hiroshi, 4,107,418, Cl. 526-184.000.
Mitter & Co.: *See*—
Mitter, Mathias, 4,106,407, Cl. 101-120.000.
Mitter, Mathias, to Mitter & Co. Deflectable hollow socket squeegee for rotary screen printer. 4,106,407, Cl. 101-120.000.
Miyamatsu, Tokuhisa: *See*—
Musha, Morito; and Miyamatsu, Tokuhisa, 4,107,384, Cl. 428-398.000.
Mizumura, Yutaka: *See*—
Fujiyoshi, Kanji; Fukuda, Minoru; Mizumura, Yutaka; Sono, Junji; and Naito, Iori, 4,107,148, Cl. 528-273.000.
Mizutani, Kohichi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas recirculator. 4,106,452, Cl. 123-119.00A.
Mobil Oil Corporation: *See*—
Chester, Arthur Warren, 4,107,032, Cl. 208-120.000.
Dwyer, Francis G., 4,107,224, Cl. 260-671.00R.
Okorodudu, Abraham O., 4,107,168, Cl. 260-302.00E.
Rollmann, Louis Deane, 4,107,195, Cl. 260-448.00C.
Schick, John W.; and Davis, Robert H., 4,107,060, Cl. 252-49.300.
Strong, Jerry G., 4,107,185, Cl. 260-348.550.
Moden, James R.; and Perkons, George, to United States of America, Navy. Aluminum alloy for primary alkaline fuel cells and batteries. 4,107,406, Cl. 429-218.000.
Modine Manufacturing Company: *See*—
Hunter, Robert L.; and Sartain, Everett L., 4,106,474, Cl. 126-110.00R.
Mohawk Data Sciences Corp.: *See*—
Angelichio, Gerald A.; and Digilio, Frank A., 4,106,406, Cl. 101-93.310.
Moiseev, Vladimir Vasilievich; Kosovtsev, Vladimir Vasilievich; Kolesnikova, Galina Prokofievna; Esina, Tamara Ivanovna; Polukhin, Alexandr Nikolaevich; and Zimnukhov, Viktor Alexandrovich. Method of preparing phenolamine resins. 4,107,141, Cl. 528-129.000.
Molchanov, Oleg Evgenievich: *See*—
Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pirogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Borisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; Shevtsov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich; Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mateshin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich; Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich; Koen, David Matveevich; Seleverstov, Vladimir Vasilievich; Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pizogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Bozisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zakharovich, 4,107,449, Cl. 13-35.000.
Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pirogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Borisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; Shevtsov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich; Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mateshin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich; Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich; Koen, David Matveevich; Seleverstov, Vladimir Vasilievich; Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pizogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Bozisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zakharovich, 4,107,449, Cl. 13-35.000.
Moll, Eberhard, to Rockwell International Corporation. Housing for electro-mechanical counter. 4,106,344, Cl. 73-431.000.
Molloy, Joseph; and Clarke, William G., to Westinghouse Electric Corp. Fuel element for a nuclear reactor. 4,106,985, Cl. 176-68.000.
Monier Colourtile Pty. Ltd.: *See*—
Aarons, Raymond Joseph, 4,106,253, Cl. 52-547.000.
Monroe Auto Equipment Company: *See*—
Meyer, Robert R., 4,106,175, Cl. 29-243.520.
Monsanto Company: *See*—
Boe, Norman W., 4,106,313, Cl. 66-202.000.
Franz, John E., 4,106,923, Cl. 71-86.000.
Morgan, Albert W.; Shull, Charles S.; and Vanderlinde, William, 4,107,122, Cl. 260-30.200.
Owsley, Dennis C.; and Bloomfield, Jordan J., 4,107,220, Cl. 260-646.000.
Wallace, James L., 4,107,793, Cl. 366-312.000.
Monsanto Research Corporation: *See*—
David, Donald J.; and Willson, Michael C., 4,106,909, Cl. 23-232.00R.
Montecatini Edison S.p.A.: *See*—
Giannini, Umberto; Cassata, Antonio; Longi, Paolo; and Mazzocchi, Romano, 4,107,414, Cl. 526-114.000.
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Montedison S.p.A.: *See*—
Giannini, Umberto; Cassata, Antonio; Longi, Paolo; and Mazzocchi, Romano, 4,107,413, Cl. 526-114.000.
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Montgomery, Murray Mathews; Gilger, William Francis; and Steiner, William Winfield, to Matson Navigation Company. Container conveyor apparatus and method for vessel loading crane-yard interface. 4,106,639, Cl. 214-14.000.
Moody, Ronald R.: *See*—
Manska, Wayne E., 4,106,769, Cl. 273-58.00B.
Mookherjee, Braja Dulal: *See*—
Wilson, Richard A.; Mookherjee, Braja Dulal; Hruza, Anne Sanderson; Vock, Manfred Hugo; Frederick, Louis Schmitt; and Vinals, Joaquin Francisco, 4,107,209, Cl. 260-586.00R.
Moon, Allen J.: *See*—
Bishop, Bruce J.; and Moon, Allen J., 4,106,901, Cl. 8-139.000.
Moon, William T., Jr.; Rogers, Arden D.; Goff, Clifford E.; and Bannon, Harry B., to Robertshaw Controls Company. Pneumatic operated switch having movable flag, switch actuator mounted thereon, and switch in chamber displaced from measured flow path. 4,107,492, Cl. 200-81.90M.
Moore, Gordon G.: *See*—
Pfeffer, Philip E.; and Moore, Gordon G., 4,107,425, Cl. 536-119.000.
Moore, James A.; and Lyon, Richard H., to Massachusetts Institute of Technology. Mode canceling composite panel for greater than mass-law transmission loss in the principal speech bands. 4,106,588, Cl. 181-284.000.
Moore, James E.; and Schroeter, Siegfried H., to General Electric Company. Method for making thermoformable composites and composites made thereby. 4,107,391, Cl. 428-483.000.
Moore, Kenneth L.; and Reed, Russell, Jr., to United States of America, Navy. Method for suppressing water evaporation using a polybutadiene film. 4,106,906, Cl. 21-60.50A.
Moore, William Thomas; and Heftman, George, to Rank Organisation Limited, The. Infra-red scanner. 4,106,845, Cl. 350-6.600.
Moorey, Ernest James, to M. L. Engineering (Plymouth) Limited. Signal monitoring circuit. 4,107,616, Cl. 328-110.000.
Moorhouse, John H. Mechanical code for operated device for access to coded electrical circuits. 4,107,655, Cl. 340-149.00R.
Moreton, Roger: *See*—
McLoughlin, Victor Conrad Richard; Moreton, Roger; and Watt, William, 4,107,408, Cl. 526-8.000.
Morgan, Albert W.; Shull, Charles S.; and Vanderlinde, William, to Monsanto Company. Copolymer plasticizers comprising novel ω-bromoalkyl esters of acyclic unsaturated dicarboxylic acids. 4,107,122, Cl. 260-30.200.
Morgan, Chester S., Jr.; Cavin, O. Burl; McCulloch, Reginald W.; and Clark, David L., to United States of America, Energy. Boron nitride insulating material. 4,106,186, Cl. 29-616.000.
Morgan Construction Company: *See*—
Jalil, Asjed A.; and Rich, C. Allen, 4,106,519, Cl. 134-122.00R.
Morgan, George H., to Lambert Brake Corporation. Core machine having hydrostatic drive. 4,106,291, Cl. 60-369.000.
Morgan, Lewis Coleman; and Reed, Clarence Arthur, to Arthur W. Reed Machine Co. Separable bracket for supporting an antenna on a vehicle trunk lid. 4,107,694, Cl. 343-715.000.
Mori, Toshikatsu; Takeuchi, Masato; Hitomi, Otane; Uno, Shigeo; Imahashi, Jinichi; and Nakajima, Fumito, to Hitachi, Ltd. Process for removing nitrogen oxides using ammonia as a reductant and sulfated metallic catalysts. 4,107,272, Cl. 423-239.000.
Morimoto, Katsuhide; Matsumura, Masaji; Yamauchi, Nobuharu; Koyanagi, Haruo; Sato, Iwao; Yasuhara, Buhei; and Sakai, Jiro, to Mitsubishi Denki Kabushiki Kaisha; and Nissan Motor Company, Limited. Operation state display apparatus. 4,107,663, Cl. 340-324.0AD.
Morinaga, Tsuto: *See*—
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Morizumi, Yosihiro: *See*—
Yuasa, Yoshio; Morizumi, Yosihiro; and Orui, Ryuzo, 4,107,572, Cl. 315-3.600.
Morokuma, Tadashi; and Tsuda, Naotsune, to Olympus Optical Co., Ltd. Method of manufacturing magnetic heads. 4,106,173, Cl. 29-603.000.
Morrill, Jan G.: *See*—
Glasfeld, Rolf D.; and Morrill, Jan G., 4,106,423, Cl. 114-74.00A.
Morris, Richard T.; and Wildvank, Arthur H. Thin wire pressure sensor. 4,106,350, Cl. 73-755.000.
Morris, Thomas E.: *See*—
Tasto, William D.; and Morris, Thomas E., 4,107,221, Cl. 260-652.00P.
Morrison, Howard J., to Marvin Glass & Associates. Multi-subscriber telephone apparatus. 4,107,477, Cl. 179-99.000.

Morrison, William McKenzie Meek, to Turner Manufacturing Company, Ltd. Gear boxes. 4,106,358, Cl. 74-331.000.

Morse, Lewis D.; Boroshok, Melvin J.; and Grabner, Roy W., to Merck & Co., Inc. Process of isolating cyclohexane-free ethylcellulose microcapsules. 4,107,072, Cl. 252-316.000.

Morton, Harry E.; and Lam, Gow T., to University of Pennsylvania. GC Antigen-specific immunochemical indicator reagent and method for preparing same. 4,107,287, Cl. 424-8.000.

Morton, Virgil R., to Verco Manufacturing, Inc. Method and apparatus for interlocking and venting a structural diaphragm. 4,106,249, Cl. 52-336.000.

Moshnin, Evgeny Nikolaevich; Nistratov, Alexei Fedorovich; Odnodushny, Viktor Alexeevich; Romashko, Nikolai Ivanovich; and Schlyakhin, Nikolai Pavlovich. Press for pressing pipe fittings. 4,106,322, Cl. 72-356.000.

Mostovsky, Alexandr Alexeevich: *See*—
Klimin, Alexandr Ivanovich; Mostovsky, Alexandr Alexeevich; and Nemchenok, Rafail Lvovich, 4,107,564, Cl. 313-94.000.

Motoren-und Turbinen-Union Friedrichshafen GmbH: *See*—
Deutschmann, Herbert; and Schier, Karl, 4,106,444, Cl. 123-41.82R.

Motorola, Inc.: *See*—
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Huntington, Robert Charles; and Cooper, James Everett, Jr., 4,107,671, Cl. 340-347.0DA.
Lai, Chi Sun; and Gunderson, Philip D., 4,106,440, Cl. 123-117.00R.
Onodera, George C., 4,106,953, Cl. 148-1.500.

Moufah, Hussein T. Ternary logic circuits with CMOS integrated circuits. 4,107,549, Cl. 307-205.000.

MPB Corporation: *See*—
Leffingwell, Bruce, 4,107,239, Cl. 260-881.000.

Muckenmuller, Helmut; and Muth, Hubert, to C. Desaga GmbH, Nachf. Erich Fecht. Device for continuous electrophoresis in a carrier free buffer current. 4,107,027, Cl. 204-301.000.

Mukaemachi, Takuzi: *See*—
Kawanami, Mitsuru; Okuhara, Shinzi; and Mukaemachi, Takuzi, 4,107,472, Cl. 179-18.0GF.

Mulders, Julien; and Gilain, Jacques, to Solvay & Cie. Method of preparing salts of poly-alpha-hydroxyacrylic acid. 4,107,411, Cl. 526-75.000.

Mulholland, Thomas Patrick Cunningham: *See*—
Haydock, David Bryan; Mulholland, Thomas Patrick Cunningham; and Thorp, Jeffrey Meyrick, 4,107,329, Cl. 424-317.000.

Multinorm, B.V.: *See*—
Oosterling, Pieter Adriaan; and van Staveren, Hendricus Cornelis, 4,106,273, Cl. 56-295.000.

Murai, Sadao; Goto, Nobuo; Tanioka, Katsuhiko; Matsunaga, Masaaki; and Isayama, Riyoiti, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Method for forming an annular groove in a thermoplastic pipe. 4,107,249, Cl. 264-68.000.

Murase, Ichiki: *See*—
Sano, Takezo; Shimomura, Takatoshi; Sasaki, Masao; and Murase, Ichiki, 4,107,049, Cl. 210-490.000.

Murata, Atsuo; Tsuchiya, Shuji; Suzuki, Hideo; and Ikeda, Hisao, to Nissan Chemical Industries Ltd. Process for producing chain terpene alcohol. 4,107,219, Cl. 568-875.000.

Murib, Jawad H., to National Distillers and Chemical Corporation. Catalytic oxidation of acrolein to acrylic acid. 4,107,204, Cl. 260-530.00N.

Murphy, Alan Pearce; and Paris, John Rene, to Procter & Gamble Company, The. Detergent composition. 4,107,067, Cl. 252-135.000.

Murphy, Richard J., to Xerox Corporation. Fusing surface for fixing xerographic toner. 4,107,389, Cl. 428-447.000.

Murphy, Timothy P., to Simmons Company. Platform bed. 4,106,138, Cl. 5-181.000.

Murray, Robert G.: *See*—
Koppelman, Edward; and Murray, Robert G., 4,106,999, Cl. 202-118.000.

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Murza-Mucha, Pawel; Koszarewski, Zbigniew; Ostaszewski, Wojciech; and Peksa, Stanislaw, to Politechnika Warszawska. Mass for production of cores and casting moulds. 4,106,548, Cl. 164-132.000.

Musante, Victor J.: *See*—
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Muschiatti, Lawrence Carl: *See*—
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Musha, Morito; and Miyamatsu, Tokuhisa, to Mitsubishi Rayon Co., Ltd. Method for producing porous fibers. 4,107,384, Cl. 428-398.000.

Mushardt, Heinrich: *See*—
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Muth, Hubert: *See*—
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Mutsaers, Cornelis Adrianus H. A.: *See*—
Boonstra, Alexander Hendrik; and Mutsaers, Cornelis Adrianus H. A., 4,107,387, Cl. 428-426.000.

Myers, Harry K., Jr.; and Schneider, Abraham, to Sun Oil Company of Pennsylvania. Catalytic codimerization of norbornadiene with acrylonitrile. 4,107,198, Cl. 260-464.000.

Myers, William D., to Microdot, Inc. Anti-vibration thread insert. 4,106,540, Cl. 151-14.0CS.

N.K.F. Kabel B.V.: *See*—
Kreuger, Frederik Hendrik; and Van Kesteren, Jacobus Petrus Ignatius, 4,106,961, Cl. 156-48.000.

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Naarden International Holland, B.V.: *See*—
Kaufman, Jerome G., 4,107,289, Cl. 424-45.000.

Nabors, James B., Jr.: *See*—
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Nadelson, Jeffrey: *See*—
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Nagai, Akihiko: *See*—
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Nagai, Katsumi: *See*—
Takahashi, Yuzo; Tanaka, Yasuyuki; Nagai, Katsumi; Takahashi, Nobuo; Matsuda, Hiroshi; Ono, Koichi; Tanaka, Kozi; and Oyama, Shiro, 4,106,420, Cl. 113-12.000.

Nagai, Takuya: *See*—
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Nagaishi, Hatuo; and Yoshimura, Tooru, to Nissan Motor Company, Limited. Exhaust gas reactor for internal combustion engine and its manufacturing method. 4,106,288, Cl. 60-282.000.

Nagamine, Takashi: *See*—
Koshiga, Fusao; Tanaka, Jinkichi; Watanabe, Itaru; Suzuki, Motoaki; Kojima, Toshifumi; Matsubara, Hiroyoshi; Osuka, Tatsumi; Takeshige, Kenji; Nagamine, Takashi; and Hirano, Osamu, 4,107,503, Cl. 219-61.000.

Nagano, Masashi; and Fujimoto, Hideaki, to Shimano Industrial Company Limited. Derailer for a bicycle. 4,106,356, Cl. 74-217.00B.

Nagara, Toshio; Nakagawa, Kogoro; Higo, Nobumasa; Kuno, Masanori; Arai, Hiroshi; and Ota, Jun, to Nippondenso Co., Ltd. Radiator cap. 4,107,493, Cl. 200-84.00C.

Nagasubramanian, Krishnamurthy; and Liu, Kang-Jen, to Allied Chemical Corporation. Recovery of TiO_2 from ilmenite-type ore by a membrane based electrodialysis process. 4,107,264, Cl. 423-81.000.

Nagasubramanian, Krishnamurthy: *See*—
Chlanda, Frederick P.; Nagasubramanian, Krishnamurthy; and Liu, Kang-Jen, 4,107,015, Cl. 204-180.00P.

Nagata, Shuji: *See*—
Yanagimoto, Samon; Kawaharada, Minoru; Nagata, Shuji; and Koyama, Fujimasa, 4,106,318, Cl. 72-199.000.

Nagendran, Sangarappillai: *See*—
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Nahshol Electronics Ltd.: *See*—
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Naiman, Charles S.: *See*—
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Naito, Iori: *See*—
Fujiyoshi, Kanji; Fukuda, Minoru; Mizumura, Yutaka; Sono, Junji; and Naito, Iori, 4,107,148, Cl. 528-273.000.

Naito, Masayoshi; and Kamei, Tatsuya, to Hitachi, Ltd. Silicon doped with cadmium to reduce lifetime. 4,107,731, Cl. 357-64.000.

Nakagawa, Kogoro: *See*—
Nagara, Toshio; Nakagawa, Kogoro; Higo, Nobumasa; Kuno, Masanori; Arai, Hiroshi; and Ota, Jun, 4,107,493, Cl. 200-84.00C.

Nakahara, Yutaka: *See*—
Minagawa, Motonobu; Nakahara, Yutaka; and Haruna, Tohru, 4,107,136, Cl. 260-45.95C.

Nakajima, Fumito: *See*—
Mori, Toshikatsu; Takeuchi, Masato; Hitomi, Otane; Uno, Shigeo; Imahashi, Jinichi; and Nakajima, Fumito, 4,107,272, Cl. 423-239.000.

Nakajima, Takashi; Irie, Tomoyuki; and Kusumoto, Keiichi, to Nippon Paint Co., Ltd. Single chamber type coating and baking apparatus. 4,106,430, Cl. 118-64.000.

Nakajima, Yasuo; and Hayashi, Yoshimasa, to Nissan Motor Company, Ltd. Internal combustion engine system with an air-fuel mixture shut off means. 4,106,471, Cl. 123-198.00F.

Nakajima, Yoshikage: *See*—
Kijima, Shizumasa; Igarashi, Toshiji; Yamatsu, Isao; Hamamura, Kimio; Nakajima, Yoshikage; Minami, Norio; Yamagishi, Youji; and Inai, Yuithi, 4,107,193, Cl. 260-410.000.

Nakamura, Kensaku. Resin material reclaiming machine. 4,106,705, Cl. 241-49.000.

Nakamura, Kenya; and Okano, Hiroshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Sealing device for a rotary regenerative heat exchanger. 4,106,553, Cl. 165-9.000.

Nakamura, Mitsuo: *See*—
Norimatsu, Hideaki; Nakamura, Mitsuo; and Kobayashi, Nobuyuki, 4,106,450, Cl. 123-119.0EC.

Nakamura, Shinji: *See*—
Takahashi, Nobuaki; Nishikawa, Kazunori; Iwasaki, Yoshiki; Satoh, Masaaki; Ohba, Katsuhiro; Nakamura, Shinji; Sawada, Tatsuo; Ohsaki, Nobuhide; Itoh, Yasuo; Suda, Nobuaki; Okabe, Yasuhisa; and Ozaki, Hideaki, 4,107,478, Cl. 179-100.4ST.

Nakamura, Toshiie; Shimizu, Hiromichi; Tanaka, Kyuichi; Kunitomo, Akihiko; and Tanizawa, Kinji, to Sankyo Company Limited. Stable

solid agricultural chemical composition and process for preparation thereof. 4,107,300, Cl. 424-200.000.
Nakamura, Yoshimi: *See*—
Sasaki, Yutaka; and Nakamura, Yoshimi, 4,107,085, Cl. 252-448.000.
Nakanishi, Yoshitaka. Chain latch for door. 4,106,800, Cl. 292-264.000.
Nakano, Toshio; Sasano, Akira; Tsutsui, Ken; and Matumaru, Haruo, to Hitachi, Ltd.; and Hitachi Electronics Ltd. Face plate for color pick-up tube. 4,107,568, Cl. 313-371.000.
Nakao, Toshihiro, to Olympus Optical Co., Ltd. Means for opening and closing a lid of cassette tape receiver portion. 4,106,663, Cl. 220-326.000.
Nakase, Takamichi: *See*—
Hattori, Tadashi; Takata, Akira; Fukuda, Tamotsu; and Nakase, Takamichi, 4,106,451, Cl. 123-119.0EC.
Nakayama, Tsuneo: *See*—
Kimura, Toshihiko; and Nakayama, Tsuneo, 4,106,595, Cl. 188-73.300.
Nakayama, Yasuharu; Hirata, Nobuhito; and Yamashita, Yoshio, to Kansai Paint Company, Limited. Aqueous emulsion compositions. 4,107,114, Cl. 260-22.0CB.
Nakazawa, Isao: *See*—
Hirota, Tetsuya; Hishida, Tadashi; Kamata, Akira; Nakazawa, Isao; and Takamisawa, Hiroshi, 4,106,993, Cl. 195-65.000.
Nakazyo, Kiyoshin: *See*—
Tanaka, Mitsugu; Nakazyo, Kiyoshin; and Arai, Atsuaki, 4,106,942, Cl. 96-100.00N.
Nalco Chemical Company: *See*—
Maciaszek, Joseph A., 4,107,073, Cl. 252-321.000.
Pessimisis, George N., 4,107,087, Cl. 252-455.00R.
Slovinsky, Manuel; and Fong, Dodd Wing, 4,107,030, Cl. 208-48.0AA.
Nali, Robert Ronald: *See*—
Liu, William Chang; Bratton, Francis H., deceased; and Nali, Robert Ronald, 4,107,259, Cl. 264-331.000.
Narricot Industries, Inc.: *See*—
Wright, Robert C., 4,106,973, Cl. 156-433.000.
Nash, Dudley O.; and Holowach, Joseph, to United States of America, National Aeronautics and Space Administration. Sound-suppressing structure with thermal relief. 4,106,587, Cl. 181-213.000.
National Distillers and Chemical Corporation: *See*—
Murib, Jawad H., 4,107,204, Cl. 260-530.00N.
National Marine Service, Inc.: *See*—
Barmeier, Harold J., Jr.; and Wright, David A., 4,107,601, Cl. 324-173.000.
National Research Development Corporation: *See*—
Cunliffe, Anthony Vernon; Pearce, Peter John; and Richards, David Hugh, 4,107,142, Cl. 528-93.000.
Epstein, David, 4,106,944, Cl. 106-38.200.
Grimsdale, Richard Lawrence; Willis, Philip John; and Hadjiaslanis, Aris, 4,107,780, Cl. 364-521.000.
McLoughlin, Victor Conrad Richard; Moreton, Roger; and Watt, William, 4,107,408, Cl. 526-8.000.
Scales, John Tracy, 4,106,130, Cl. 3-1.910.
National Rolling Mills Company: *See*—
Jones, Paul H., 4,106,878, Cl. 403-28.000.
National Storage Systems, Inc.: *See*—
Zapara, Gerald A., 4,106,248, Cl. 52-234.000.
Nayar, Harbhajan S., to Airco, Inc. Methods for sintering powder metallurgy parts. 4,106,931, Cl. 75-201.000.
Naylor, Floyd E.; and Zelinski, Robert P., to Phillips Petroleum Company. Hydrogenated block copolymers containing a block derived from low vinyl polybutadiene and a block derived from medium vinyl polybutadiene. 4,107,236, Cl. 260-879.000.
NCR Corporation: *See*—
Adams, Robert Clarence; and Sweigart, James H., 4,106,962, Cl. 156-73.100.
Farber, Sheldon, 4,107,428, Cl. 542-437.000.
Neeff, Harry B. Portable prover barrel. 4,106,328, Cl. 73-3.000.
Neff, Charles G., to Beebe, William F., a part interest. Fluid wedged double lock fifth wheel. 4,106,793, Cl. 280-435.000.
Negre, Henri; and Cathiard, Jean-Pierre. Ship and shore load handling system with an asymmetrical shaped pontoon for supporting carriage cables. 4,106,638, Cl. 214-14.000.
Nehring, Jurgen: *See*—
Doriguzzi, Rino; Egloff, Markus; Kaufmann, Meinolph; Nehring, Jurgen; and Scheffer, Terry J., 4,106,859, Cl. 350-338.000.
Nelson, Gunner E.; and Pearson, Tillmon H., to Ethyl Corporation. Metal sequestering method. 4,107,064, Cl. 252-89.00R.
Nelson, Hugh Wharton, to Combustion Engineering, Inc. Method of preventing explosions using a smelt water explosion inhibitor. 4,106,978, Cl. 162-1.000.
Nelson, John P.; and Hanaway, Roger D., to Allis-Chalmers Corporation. Floating grain bin extension for use with agricultural combine. 4,106,649, Cl. 214-522.000.
Nelson, Lloyd A.: *See*—
Sekhon, Kalwant S.; Nelson, Lloyd A.; and Fritz, John E., Jr., 4,106,188, Cl. 29-631.000.
Nelson, Norman A., to Upjohn Company, The. 2-Decarboxy-2-hydroxy-methyl-5-oxa-ω-phenoxy-PGE$_1$ compounds. 4,107,211, Cl. 260-590.00C.
Nelson, Norman A., to Upjohn Company, The. 2-Decarboxy-2-hydroxymethyl-ω-phenyl-PGA or 9-deoxy-9,10-didehydro-PGD analogs. 4,107,212, Cl. 260-590.00C.
Nelson, Norman A., to Upjohn Company, The. 2-Decarboxy-2-hydroxy-methyl-5-oxa-ω-phenoxy-PGD$_1$ compounds. 4,107,213, Cl. 260-590.00C.
Nelson, Norman A., to Upjohn Company, The. 2-Decarboxy-2-hydroxy-methyl-3,7-inter-m-phenylene-ω-phenoxy-PGD$_1$ compounds. 4,107,214, Cl. 260-590.00C.
Nelson, Norman A., to Upjohn Company, The. 2-Decarboxy-2-hydroxymethyl-3,7-inter-m-phenylene-ω-phenyl-PGE$_1$ compounds. 4,107,215, Cl. 260-590.00C.
Nelson, Norman A., to Upjohn Company, The. 2-Decarboxy-2-hydroxy-methyl-ω-phenyl-PGD analogs. 4,107,216, Cl. 260-590.00C.
Nelson, Roger K. Method of handling Drosophila. 4,106,438, Cl. 119-1.000.
Nelsson, Nels, to United States Gypsum Company. Relocatable wall mounting system. 4,106,251, Cl. 52-765.000.
Nemchenok, Rafail Lvovich: *See*—
Klimin, Alexandr Ivanovich; Mostovsky, Alexandr Alexeevich; and Nemchenok, Rafail Lvovich, 4,107,564, Cl. 313-94.000.
Nemeth, Edwin A., to P. N. Associates, Inc. Self-powered folding golf cart. 4,106,583, Cl. 180-65.00E.
Nemeth, Harold C., to Akzona Incorporated. Stable water dispersions of encapsulated parathion. 4,107,292, Cl. 424-78.000.
Nercessian, Sarkis: *See*—
Birman, Paul; and Nercessian, Sarkis, 4,107,620, Cl. 330-265.000.
Neri, Filippo; and Albrande, Alfredo, to Selenia-Industrie Elettroniche Associate S.p.A. Device for controlling the conical scanning frequency for conical scanning radar systems. 4,107,683, Cl. 343-18.00E.
Neveux, Rene Elie, to Societe Anonyme Francaise du Ferodo. Deflector for heat exchanger tube, its manufacturing method and exchanger comprising such deflectors. 4,106,558, Cl. 165-109.000.
New England Envelope Manufacturing: *See*—
Howatt, George Frederick, 4,106,431, Cl. 118-203.000.
New England Nuclear Corporation: *See*—
Pratt, Frederick P.; and Gagnon, David L., 4,107,283, Cl. 424-1.000.
Niccolls, Paul L., to Empire Foods, Inc. Poultry cleaning apparatus and method. 4,106,161, Cl. 17-11.000.
Nicely, Charles W.: *See*—
Becker, Frederick R., III; and Nicely, Charles W., 4,106,736, Cl. 248-222.200.
Nicol, Thomas: *See*—
Hill, William Frank; and Nicol, Thomas, 4,107,658, Cl. 340-620.000.
Niehaus, William Charles: *See*—
DiLorenzo, James Vincent; Niehaus, William Charles; and Varnerin, Lawrence John, Jr., 4,106,959, Cl. 148-175.000.
Nielsen, Edwin A.: *See*—
Carella, Vincent; and Nielsen, Edwin A., 4,106,695, Cl. 238-10.00F.
Nielsen, Leif, to Danfoss A/S. Valve arrangement for refrigeration plants. 4,106,691, Cl. 236-92.00B.
Nihei, Hideharu: *See*—
Isojima, Tsuyoshi; Enokida, Kenji; Nihei, Hideharu; and Ichise, Wataru, 4,107,565, Cl. 313-174.000.
Nii, Yoshiji; Matsuda, Takayuki; Yamazaki, Yoichi; and Nohara, Haruo, to Hitachi, Ltd.; and Tokyo Electric Power Co., Inc., The. Digital fault-location calculation system. 4,107,778, Cl. 364-492.000.
Niimi, Itaru: *See*—
Bunda, Tsuchio; Niimi, Itaru; Kaneko, Yasuhisa; and Noda, Fumiyoshi, 4,106,913, Cl. 23-288.0FC.
Niino, Yasukazu; and Nagai, Takuya, to Nishinippon Engineering Co., Ltd. Valve with two valve plates. 4,106,748, Cl. 251-133.000.
Niles, Albert B.: *See*—
Gardner, John W.; Grgurich, William A.; and Niles, Albert B., 4,106,702, Cl. 239-533.300.
Nippon Cable System Inc.: *See*—
Baba, Masanao, 4,106,604, Cl. 192-0.098.
Nippon Electric Co., Ltd.: *See*—
Iwata, Shigehisa, 4,107,704, Cl. 354-23.00D.
Maruta, Rikio, 4,107,470, Cl. 179-15.0FS.
Saburi, Akio, 4,107,608, Cl. 325-4.000.
Yuasa, Yoshio; Morizumi, Yoshiro; and Orui, Ryuzo, 4,107,572, Cl. 315-3.600.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Yoshida, Takashi; and Matsuyama, Takeshi, 4,107,725, Cl. 357-41.000.
Nippon Kasei Chemical Co., Ltd.: *See*—
Kameyama, Akinori; Matsunaga, Yoshiki; and Saito, Hiroyasu, 4,107,119, Cl. 260-29.4UA.
Nippon Kayaku Kabushiki Kaisha: *See*—
Tashiro, Yasuhisa; Sugimura, Hideo; Arai, Toshiaki; Suzuki, Masao; and Shirai, Tadashi, 4,107,203, Cl. 260-518.00R.
Watanabe, Hiroshi, 4,107,302, Cl. 424-200.000.
Nippon Kokan Kabushiki Kaisha: *See*—
Koshiga, Fusao; Tanaka, Jinkichi; Watanabe, Itaru; Suzuki, Motoaki; Kojima, Toshifumi; Matsubara, Hiroyoshi; Osuka, Tatsumi; Takeshige, Kenji; Nagamine, Takashi; and Hirano, Osamu, 4,107,503, Cl. 219-61.000.
Okada, Yutaka; Sasaguri, Kyoji; and Ishihara, Kazuo, 4,106,998, Cl. 201-39.000.
Nippon Paint Co., Ltd.: *See*—
Nakajima, Takashi; Irie, Tomoyuki; and Kusumoto, Keiichi, 4,106,430, Cl. 118-64.000.
Nippon Soken, Inc.: *See*—
Hattori, Tadashi; Takata, Akira; Fukuda, Tamotsu; and Nakase, Takamichi, 4,106,451, Cl. 123-119.0EC.
Noguchi, Masaaki; Sumiyoshi, Masaharu; Tanaka, Yukiyasu; and Tanaka, Taro, 4,106,448, Cl. 123-119.0LR.
Nippon Steel Corporation: *See*—
Asakawa, Kenichi; and Yoshida, Makoto, 4,107,357, Cl. 427-300.000.

Ochiai, Tsunemi; and Nishitani, Teruyuki, 4,107,244, Cl. 264-30.000.
Yanagimoto, Samon; Kawaharada, Minoru; Nagata, Shuji; and Koyama, Fujimasa, 4,106,318, Cl. 72-199.000.
Nippondenso Co., Ltd.: *See*—
Arai, Hiroshi; and Taniguchi, Koichi, 4,107,646, Cl. 340-52.00F.
Nagara, Toshio; Nakagawa, Kogoro; Higo, Nobumasa; Kuno, Masanori; Arai, Hiroshi; and Ota, Jun, 4,107,493, Cl. 200-84.00C.
Norimatsu, Hideaki; Nakamura, Mitsuo; and Kobayashi, Nobuyuki, 4,106,450, Cl. 123-119.0EC.
Yoshino, Muneki, 4,107,647, Cl. 340-71.000.
Nishigaki, Susumu; and Ohgoshi, Akio, to Sony Corporation. Flame detecting apparatus. 4,107,657, Cl. 340-579.000.
Nishii, Noboru: *See*—
Sunamori, Takashi; and Nishii, Noboru, 4,107,156, Cl. 526-91.000.
Nishijima, Tadashi, to Tokyo Shibaura Electric Co., Ltd. Numerical control system having a position processing unit operated upon a power failure. 4,107,654, Cl. 340-147.0MT.
Nishikawa, Kazunori: *See*—
Takahashi, Nobuaki; Nishikawa, Kazunori; Iwasaki, Yoshiki; Satoh, Masaaki; Ohba, Katsuhiro; Nakamura, Shinji; Sawada, Tatsuo; Ohsaki, Nobuhide; Itoh, Yasuo; Suda, Nobuaki; Okabe, Yasuhisa; and Ozaki, Hideaki, 4,107,478, Cl. 179-100.4ST.
Nishimura, Matsuo, to Yasui Sangyo Co., Ltd. Elevatable depalletizing system. 4,106,635, Cl. 214-8.50A.
Nishinippon Engineering Co., Ltd.: *See*—
Niino, Yasukazu; and Nagai, Takuya, 4,106,748, Cl. 251-133.000.
Nishitani, Teruyuki: *See*—
Ochiai, Tsunemi; and Nishitani, Teruyuki, 4,107,244, Cl. 264-30.000.
Niskin, Shale J. Rotatable valve assembly. 4,106,751, Cl. 251-316.000.
Nissan Chemical Industries Ltd.: *See*—
Murata, Atsuo; Tsuchiya, Shuji; Suzuki, Hideo; and Ikeda, Hisao, 4,107,219, Cl. 568-875.000.
Nissan Motor Company, Limited: *See*—
Aoki, Hiroyuki; Takao, Hiroshi; and Oyamada, Akira, 4,107,392, Cl. 428-547.000.
Morimoto, Katsuhide; Matsumura, Masaji; Yamauchi, Nobuharu; Koyanagi, Haruo; Sato, Iwao; Yasuhara, Buhei; and Sakai, Jiro, 4,107,663, Cl. 340-324.0AD.
Nagaishi, Hatuo; and Yoshimura, Tooru, 4,106,288, Cl. 60-282.000.
Nakajima, Yasuo; and Hayashi, Yoshimasa, 4,106,471, Cl. 123-198.00F.
Nozawa, Koji; and Ohba, Motoichi, 4,106,365, Cl. 74-740.000.
Sakurai, Shinichiro, 4,106,807, Cl. 296-28.00R.
Takao, Hiroshi; and Matoba, Kazuo, 4,107,019, Cl. 204-195.00S.
Nissei Shipping Co., Ltd.: *See*—
Omote, Sadao, 4,106,640, Cl. 214-14.000.
Nistratov, Alexei Fedorovich: *See*—
Moshnin, Evgeny Nikolaevich; Nistratov, Alexei Fedorovich; Odnodushny, Viktor Alexeevich; Romashko, Nikolai Ivanovich; and Schlyakhin, Nikolai Pavlovich, 4,106,322, Cl. 72-356.000.
Nitro Nobel: *See*—
Erixon, Berthold, 4,107,453, Cl. 174-87.000.
Nitto Chemical Industry Co., Ltd.: *See*—
Sasaki, Yutaka; and Nakamura, Yoshimi, 4,107,085, Cl. 252-448.000.
Niwa, Kuniyuki: *See*—
Eto, Kunihiko; Niwa, Kuniyuki; and Owa, Kaoru, 4,107,589, Cl. 318-602.000.
Nl Hycalog: *See*—
Zabcik, Clarence John, 4,106,779, Cl. 277-27.000.
No-Joint Concrete Pipe Co.: *See*—
McNeill, Charles T., 4,106,300, Cl. 61-72.200.
Noda, Fumiyoshi: *See*—
Bunda, Tsuchio; Niimi, Itaru; Kaneko, Yasuhisa; and Noda, Fumiyoshi, 4,106,913, Cl. 23-288.0FC.
Noel, Eugene M. Controlled process muffin griddle. 4,106,400, Cl. 99-373.000.
Noguchi, Masaaki; Sumiyoshi, Masaharu; Tanaka, Yukiyasu; and Tanaka, Taro, to Nippon Soken, Inc. Internal combustion engine and method of operation. 4,106,448, Cl. 123-119.0LR.
Nohara, Haruo: *See*—
Nii, Yoshiji; Matsuda, Takayuki; Yamazaki, Yoichi; and Nohara, Haruo, 4,107,778, Cl. 364-492.000.
Nolan, James F., to Owens-Illinois, Inc. Transfer within gaseous discharge display/memory device. 4,107,577, Cl. 315-169.0TV.
Nomaki, Koji; Saoyama, Yoshihito; and Tamamura, Ryo, to Asahi Glass Company, Ltd. Solder alloys for soldering difficultly solderable material. 4,106,930, Cl. 75-134.00B.
Nomura, Yasuji: *See*—
Kotabe, Munenori; and Nomura, Yasuji, 4,107,535, Cl. 250-406.000.
Noranda Mines Limited: *See*—
Loutfy, Raouf O.; and Ho, Paul P. K., 4,107,025, Cl. 204-290.00F.
Norimatsu, Hideaki; Nakamura, Mitsuo; and Kobayashi, Nobuyuki, to Nippondenso Co., Ltd.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Air-to-fuel ratio feedback control system. 4,106,450, Cl. 123-119.0EC.
Noring, Josef: *See*—
Rudolph, Siegfried; Noring, Josef; and Schreiber, August, 4,107,040, Cl. 210-159.000.
Norland, Kenneth S.: *See*—
Brewer, William R.; Norland, Kenneth S.; and Wright, Richard F., 4,106,861, Cl. 350-354.000.
Norris, Alan Hedley; and Chambley, Phillip Wayne, to Champion International Corporation. Method for producing multicolor printed web material. 4,106,896, Cl. 8-62.000.
Norris, Aubrey O.: *See*—
West, Curtis W.; Lee, Larry E.; and Norris, Aubrey O., 4,106,581, Cl. 180-54.00B.
Norris, George F.: *See*—
Schuette, William H.; and Norris, George F., 4,106,492, Cl. 128-2.00V.
Northern Electric Company: *See*—
Scher, Victor H.; Fox, Theodore A.; and Sandford, Philip A., 4,107,509, Cl. 219-211.000.
Northern Telecom Limited: *See*—
Henderson, Edward Lloyd, 4,107,476, Cl. 179-84.00T.
Hillman, Garth Decker, 4,107,540, Cl. 250-566.000.
Novak, Arthur F.: *See*—
Bailey, August V.; Boudreaux, Gordon J.; Sumrell, Gene; and Novak, Arthur F., 4,107,192, Cl. 260-410.500.
Novar Electronics Corporation: *See*—
Ott, James H., 4,107,775, Cl. 364-413.000.
Novo Industri A/S: *See*—
Markussen, Erik Kjaer; and Schmidt, Arne Wintherhalter, 4,106,991, Cl. 195-63.000.
Nozaki, Sumio: *See*—
Ban, Itsuki; Nozaki, Sumio; Kasuya, Takanori; Shinkado, Yukio; and Yano, Kanji, 4,107,750, Cl. 360-106.000.
Nozawa, Koji; and Ohba, Motoichi, to Nissan Motor Company, Limited. Power train arrangement for surface-handling vehicle. 4,106,365, Cl. 74-740.000.
Numata, Saburo; and Okazaki, Shinichiro, to Fuji Photo Optical Co., Ltd. Analogue operation adjusting means for photographic camera. 4,107,707, Cl. 354-50.000.
Nutrilite Products, Inc.: *See*—
Chauthani, Abdul Rehman, 4,107,294, Cl. 424-93.000.
Occidental Oil Shale, Inc.: *See*—
French, Gordon B., 4,106,814, Cl. 299-2.000.
OCE-van der Grinten N.V.: *See*—
Ophey, Petrus J. M., 4,106,868, Cl. 355-3.0TR.
Ochiai, Tsunemi; and Nishitani, Teruyuki, to Nippon Steel Corporation. Method and apparatus for repairing damaged surface of refractory lined vessel. 4,107,244, Cl. 264-30.000.
Ocker, Herbert, to Werner & Pfleiderer. Screw extruder for continuously processing and degasing of elastomers and polymers having a viscosity of more than 1,000 poise. 4,107,787, Cl. 366-75.000.
Oddell, Leonard George, to EMI Limited. X-ray generating tubes. 4,107,563, Cl. 313-60.000.
Odnodushny, Viktor Alexeevich: *See*—
Moshnin, Evgeny Nikolaevich; Nistratov, Alexei Fedorovich; Odnodushny, Viktor Alexeevich; Romashko, Nikolai Ivanovich; and Schlyakhin, Nikolai Pavlovich, 4,106,322, Cl. 72-356.000.
Odom, Gary C.: *See*—
Gillen, John E.; and Odom, Gary C., 4,106,145, Cl. 9-5.000.
Oe, Etsuo: *See*—
Sonobe, Hisao; Okada, Sadayuki; Oe, Etsuo; Tsukioka, Hideo; and Sato, Moriichi, 4,106,557, Cl. 165-105.000.
Oetiker, Hans. At least two-partite clamping sleeve for connection of two pipe ends provided with flanges. 4,106,799, Cl. 285-365.000.
Officina Meccanica Pisani Luigi: *See*—
Pisani, Luigi, 4,106,715, Cl. 242-57.100.
Ogle, James A.; and Holz, George E., to Burroughs Corporation. Panel-type display device. 4,107,576, Cl. 315-169.0TV.
Ogura, Katsuyuki: *See*—
Tsuchihashi, Genichi; and Ogura, Katsuyuki, 4,107,178, Cl. 260-332.20A.
Ogushi, Akira: *See*—
Tabuchi, Hideho; and Ogushi, Akira, 4,107,533, Cl. 250-364.000.
Ohba, Katsuhiro: *See*—
Takahashi, Nobuaki; Nishikawa, Kazunori; Iwasaki, Yoshiki; Satoh, Masaaki; Ohba, Katsuhiro; Nakamura, Shinji; Sawada, Tatsuo; Ohsaki, Nobuhide; Itoh, Yasuo; Suda, Nobuaki; Okabe, Yasuhisa; and Ozaki, Hideaki, 4,107,478, Cl. 179-100.4ST.
Ohba, Motoichi: *See*—
Nozawa, Koji; and Ohba, Motoichi, 4,106,365, Cl. 74-740.000.
Ohgoshi, Akio: *See*—
Nishigaki, Susumu; and Ohgoshi, Akio, 4,107,657, Cl. 340-579.000.
Ohki, Hiroshi: *See*—
Otobe, Takashi; Kojima, Chiaki; and Ohki, Hiroshi, 4,107,729, Cl. 358-4.000.
Ohno, Kosaku: *See*—
Campbell, George Thomas Richardson; Kasuga, Toshishige; and Ohno, Kosaku, 4,106,641, Cl. 214-15.00R.
Ohsaki, Nobuhide: *See*—
Takahashi, Nobuaki; Nishikawa, Kazunori; Iwasaki, Yoshiki; Satoh, Masaaki; Ohba, Katsuhiro; Nakamura, Shinji; Sawada, Tatsuo; Ohsaki, Nobuhide; Itoh, Yasuo; Suda, Nobuaki; Okabe, Yasuhisa; and Ozaki, Hideaki, 4,107,478, Cl. 179-100.4ST.
Ohsugi, Katsuhisa; Takeuchi, Daizo; Hamada, Masahiro; and Kano, Tamotsu, to Kureha Kagaku Kogyo Kabushiki Kaisha. Method of cultivating *Methylomonas probus* on methanol containing medium. 4,106,988, Cl. 195-49.000.
Ohta, Mitsunori: *See*—
Tomono, Makoto; Yamakawa, Goichi; and Ohta, Mitsunori, 4,107,062, Cl. 252-62.10P.
Okabe, Yasuhisa: *See*—
Takahashi, Nobuaki; Nishikawa, Kazunori; Iwasaki, Yoshiki; Satoh, Masaaki; Ohba, Katsuhiro; Nakamura, Shinji; Sawada, Tatsuo; Ohsaki, Nobuhide; Itoh, Yasuo; Suda, Nobuaki; Okabe, Yasuhisa; and Ozaki, Hideaki, 4,107,478, Cl. 179-100.4ST.

Okada, Sadayuki: *See*—
Sonobe, Hisao; Okada, Sadayuki; Oe, Etsuo; Tsukioka, Hideo; and Sato, Moriichi, 4,106,557, Cl. 165-105.000.
Okada, Yutaka; Sasaguri, Kyoji; and Ishihara, Kazuo, to Nippon Kokan Kabushiki Kaisha. Method of restraining emission from coke quenching equipment. 4,106,998, Cl. 201-39.000.
Okano, Hiroshi: *See*—
Nakamura, Kenya; and Okano, Hiroshi, 4,106,553, Cl. 165-9.000.
Okazaki Manufacturing Company Ltd.: *See*—
Okazaki, Tatsuo, 4,107,021, Cl. 204-263.000.
Okazaki, Shinichiro: *See*—
Numata, Saburo; and Okazaki, Shinichiro, 4,107,707, Cl. 354-50.000.
Okazaki, Tatsuo, to Okazaki Manufacturing Company Ltd. Water pot with an electrolyzing device. 4,107,021, Cl. 204-263.000.
Oki Electric Industry Co., Ltd.: *See*—
Ishino, Hiroshi, 4,107,547, Cl. 307-203.000.
Okorodudu, Abraham O., to Mobil Oil Corporation. Phosphorus substituted dimercapto thiadiazoles. 4,107,168, Cl. 260-302.00E.
Okuhara, Shinzi: *See*—
Kawanami, Mitsuru; Okuhara, Shinzi; and Mukaemachi, Takuzi, 4,107,472, Cl. 179-18.0GF.
Olin Corporation: *See*—
Tobin, John H., 4,107,377, Cl. 260-306.80D.
Oliphant, Howard G., to Kochs, H. W., Jr.; Geer, R. M.; and Cason, Lois Jean. Fire door for trailers. 4,106,236, Cl. 49-141.000.
Oliver, David L.: *See*—
Fields, Marvin C.; Oliver, David L.; and Snyder, Arthur R., 4,106,917, Cl. 55-31.000.
Oliver, John F. Automatic fireplace heating system. 4,106,693, Cl. 237-51.000.
Olkhovsky, Valery Leonidovich: *See*—
Cherepin, Valentin Tikhonovich; and Olkhovsky, Valery Leonidovich, 4,107,527, Cl. 250-309.000.
Olsson, Kjell Olow Ingemar: *See*—
Borg, Lars Uno; Kamp, Lars Ragnar; and Olsson, Kjell Olow Ingemar, 4,107,253, Cl. 246-182.00B.
Olympia, Frederick D.: *See*—
Clishem, Thomas A.; Olympia, Frederick D.; and Pokallus, Leonard W., 4,107,255, Cl. 264-299.000.
Olympus Optical Co., Ltd.: *See*—
Fujii, Toru, 4,106,854, Cl. 350-176.000.
Hashimoto, Akihiko; and Enomoto, Fuzio, 4,107,705, Cl. 354-29.000.
Morokuma, Tadashi; and Tsuda, Naotsune, 4,106,173, Cl. 29-603.000.
Nakao, Toshihiro, 4,106,663, Cl. 220-326.000.
Shimoda, Misao, 4,107,751, Cl. 360-122.000.
Omote, Sadao, to Nissei Shipping Co., Ltd. Loading apparatus for cargo vessel. 4,106,640, Cl. 214-14.000.
Omura, Satoshi; Iwai, Yuzuru; and Hirano, Atsushi, to Kitasato Institute, The. Antibiotic compound. 4,107,297, Cl. 424-122.000.
O'Neill, Eugene T.; and Flach, Donald O., to FMC Corporation. Animal confinement environment control. 4,107,268, Cl. 423-210.000.
Onishi, Tsutomu: *See*—
Akiyoshi, Toshio; Onishi, Tsutomu; and Haikawa, Shozo, 4,106,371, Cl. 81-57.140.
Ono, Koichi: *See*—
Takahashi, Yuzo; Tanaka, Yasuyuki; Nagai, Katsumi; Takahashi, Nobuo; Matsuda, Hiroshi; Ono, Koichi; Tanaka, Kozi; and Oyama, Shiro, 4,106,420, Cl. 113-12.000.
Ono, Takayoshi, to Toyota Tidoshakogyo Kabushiki Kaisha. Fluid reservoir. 4,106,666, Cl. 220-373.000.
Onodera, George C., to Motorola, Inc. Method of producing an ion implanted tuning diode. 4,106,953, Cl. 148-1.500.
Ontario Energy Corporation: *See*—
Lorenz, Gordon Ronald, 4,107,029, Cl. 208-11.0LE.
Oosterling, Pieter Adriaan; and van Staveren, Hendricus Cornelis, to Multinorm, B.V. Mower. 4,106,273, Cl. 56-295.000.
Opalka, Chester J., Jr.: *See*—
Lesher, George Y.; and Opalka, Chester J., Jr., 4,107,315, Cl. 424-263.000.
Ophey, Petrus J. M., to OCE-van der Grinten N.V. Electrographic copying apparatus with surface-to-surface image transfers. 4,106,868, Cl. 355-3.0TR.
Oppenheim, Richard Charles; Marty, Jennifer Joy; and Speiser, Peter, to Pharmaceutical Society of Victoria. Injectable compositions, nanoparticles useful therein, and process of manufacturing same. 4,107,288, Cl. 424-22.000.
Orbanic, Robert Stephen: *See*—
Jayne, Max Leroy; Orbanic, Robert Stephen; and Lapraik, Scott Jack, 4,106,838, Cl. 339-99.00R.
Oriental Yeast Co. Ltd.: *See*—
Suzuki, Yasuo; Takagahara, Isamu; Fujita, Tsuyoshi; Fujii, Katsumi; and Horio, Takekazu, 4,107,014, Cl. 204-180.00R.
Ormond, Alfred Newman. Amplifier system having signal gain independent of a reference voltage. 4,107,618, Cl. 330-51.000.
Ortell, Alexander Rudolph, to Teledyne Brown Engineering, a Division of Teledyne Industries, Inc. Aircraft folding airfoil system. 4,106,727, Cl. 244-49.000.
Ortmanns, Theodor; Apelt, Heinz; and Packes, Helmut, to Otto Junker GmbH. Method of and apparatus for serving helical coils with a protective band. 4,106,709, Cl. 242-7.030.
Orui, Ryuzo: *See*—
Yuasa, Yoshio; Morizumi, Yosihiro; and Orui, Ryuzo, 4,107,572, Cl. 315-3.600.
Osaka Kasei Company Limited: *See*—
Watanabe, Hiroshi, 4,107,302, Cl. 424-200.000.
Osby, Warren J.: *See*—
Strunc, Gerald R.; and Osby, Warren J., 4,106,685, Cl. 226-136.000.
Oscilloquartz Sa: *See*—
Graf, Erhard; and Wiedmer, Jean-Pierre, 4,107,623, Cl. 331-1.00A.
Osgood, George M. Liquid rheostat. 4,107,641, Cl. 338-55.000.
Oshima, Yujiro: *See*—
Yamada, Masatoshi; Oshima, Yujiro; Hattori, Katsuhiko; and Suzuki, Hideyuki, 4,106,446, Cl. 123-90.130.
Ostaszewski, Wojciech: *See*—
Murza-Mucha, Pawel; Koszarewski, Zbigniew; Ostaszewski, Wojciech; and Peksa, Stanislaw, 4,106,548, Cl. 164-132.000.
Osuka, Tatsumi: *See*—
Koshiga, Fusao; Tanaka, Jinkichi; Watanabe, Itaru; Suzuki, Motoaki; Kojima, Toshifumi; Matsubara, Hiroyoshi; Osuka, Tatsumi; Takeshige, Kenji; Nagamine, Takashi; and Hirano, Osamu, 4,107,503, Cl. 219-61.000.
Oswald Forst Maschinenfabrik und Apparatebauanstalt GmbH: *See*—
Marten, Wolfgang; Holstein, Herbert; and Esser, Gustav, 4,106,785, Cl. 279-4.000.
Oswald, Heinz; and Wust, Olivier, to Rieter Machine Works Ltd. Chuck for a tube acting as a package support. 4,106,711, Cl. 242-19.000.
Ota, Jun: *See*—
Nagara, Toshio; Nakagawa, Kogoro; Higo, Nobumasa; Kuno, Masanori; Arai, Hiroshi; and Ota, Jun, 4,107,493, Cl. 200-84.00C.
Otis Engineering Corporation: *See*—
McCracken, Oliver W., 4,107,697, Cl. 346-33.00R.
Otobe, Takashi; Kojima, Chiaki; and Ohki, Hiroshi, to Sony Corporation. Method and apparatus for reproducing signals from a rotating record medium and method and apparatus for making same. 4,107,729, Cl. 358-4.000.
Ott, James H., to Novar Electronics Corporation. Human body comparison using driving point parameters. 4,107,775, Cl. 364-413.000.
Otteson, Kenneth Melvin; and Dawson, Daniel Joseph, to Dynapol. Edibles containing colorants having ethylsulfonate-alkylamine backbones. 4,107,336, Cl. 426-250.000.
Otto Junker GmbH: *See*—
Ortmanns, Theodor; Apelt, Heinz; and Packes, Helmut, 4,106,709, Cl. 242-7.030.
Otto, Paul R.; and Mandel, Alan F., to Westinghouse Electric Corp. Methods and tools for servicing an elevator system. 4,106,593, Cl. 187-29.00R.
Oude Alink, Bernardus A.; and Thompson, Neil E. S., to Petrolite Corporation. Substituted pyridines and dihydropyridines as corrosion inhibitors. 4,106,904, Cl. 21-2.70R.
Ouimet, Raymond Joseph; Wojtowicz, Edward Arthur; Lund, George Edward; and Fiorentino, Ermenegildo, to Burroughs Corporation. Recirculation buffer subsystem for use in sorting and processing articles including mail flats. 4,106,636, Cl. 214-11.00R.
Ovshinsky, Stanford R.: *See*—
Chang, Yew C.; Ovshinsky, Stanford R.; and Strand, David A., 4,106,939, Cl. 96-48.00R.
Owa, Kaoru: *See*—
Eto, Kunihiko; Niwa, Kuniyuki; and Owa, Kaoru, 4,107,589, Cl. 318-602.000.
Owen, William S., Jr.; and Lovejoy, George C., to General Electric Company. Method for stripping insulation from wire. 4,106,377, Cl. 83-4.000.
Owens-Corning Fiberglas Corporation: *See*—
Costin, Darryl J., 4,107,450, Cl. 13-35.000.
Lin, Kingso C.; and Hammond, Donald J., 4,107,117, Cl. 260-28.50B.
McCoy, Richard Alan, 4,107,118, Cl. 260-29.2EP.
Owens-Illinois, Inc.: *See*—
Amberg, Stephen W.; and Doherty, Thomas E., 4,106,397, Cl. 93-55.10R.
Nolan, James F., 4,107,577, Cl. 315-169.0TV.
Owsley, Dennis C.; and Bloomfield, Jordan J., to Monsanto Company. Gas phase nitration of chlorobenzene. 4,107,220, Cl. 260-646.000.
Oyaizu, Yoshijiro: *See*—
Takahashi, Akio; Saito, Hirokichi; and Oyaizu, Yoshijiro, 4,107,151, Cl. 528-54.000.
Oyama, Makoto, to United Chemi-Con, Inc. Electrolytic capacitor and electrolyte. 4,107,761, Cl. 361-433.000.
Oyama, Shiro: *See*—
Takahashi, Yuzo; Tanaka, Yasuyuki; Nagai, Katsumi; Takahashi, Nobuo; Matsuda, Hiroshi; Ono, Koichi; Tanaka, Kozi; and Oyama, Shiro, 4,106,420, Cl. 113-12.000.
Oyamada, Akira: *See*—
Aoki, Hiroyuki; Takao, Hiroshi; and Oyamada, Akira, 4,107,392, Cl. 428-547.000.
Ozaki, Hideaki: *See*—
Takahashi, Nobuaki; Nishikawa, Kazunori; Iwasaki, Yoshiki; Satoh, Masaaki; Ohba, Katsuhiro; Nakamura, Shinji; Sawada, Tatsuo; Ohsaki, Nobuhide; Itoh, Yasuo; Suda, Nobuaki; Okabe, Yasuhisa; and Ozaki, Hideaki, 4,107,478, Cl. 179-100.4ST.
Ozbey, Ahmet M.: *See*—
Ozbey, Amber Lola; and Ozbey, Ahmet M., 4,106,501, Cl. 128-62.00A.
Ozbey, Amber Lola; and Ozbey, Ahmet M. Sweeping fluid spray oral hygiene device. 4,106,501, Cl. 128-62.00A.
P. Ferrero & C. S.p.A.: *See*—
Dogliotti, Amilcare, 4,106,657, Cl. 220-23.400.

P. N. Associates, Inc.: *See*—
Nemeth, Edwin A., 4,106,583, Cl. 180-65.00E.

Pachter, Irwin J.: *See*—
Rajagopalan, Parthasarathi; and Pachter, Irwin J., 4,107,165, Cl. 260-288.0CE.

Pacific Fireplace Furnishings, Inc.: *See*—
Harsha, Robert W., 4,106,476, Cl. 126-140.000.

Pacific Handy Cutter, Inc.: *See*—
Smithline, John P., 4,106,196, Cl. 30-294.000.

Packes, Helmut: *See*—
Ortmanns, Theodor; Apelt, Heinz; and Packes, Helmut, 4,106,709, Cl. 242-7.030.

Pako Corporation: *See*—
Diesch, Robert E., 4,106,716, Cl. 242-75.430.
Strunc, Gerald R.; and Osby, Warren J., 4,106,685, Cl. 226-136.000.

Paluch, Edward S., to Reliable Electric Company. Electrical connector. 4,106,837, Cl. 339-98.000.

Palumbo, Angeline. Convertible garment. 4,106,125, Cl. 2-213.000.

Paly, Gennady Mikhailovich: *See*—
Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pirogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Borisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; Shevtsov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich; Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mateshin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich; Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich; Koen, David Matveevich; Seleverstov, Vladimir Vasilievich; Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pizogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Bozisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zakharovich, 4,107,449, Cl. 13-35.000.

Panelfold, Inc.: *See*—
Dixon, Guy E.; and Dixon, Thomas M., 4,106,544, Cl. 160-199.000.

Papa, Anthony Joseph: *See*—
Dunleavy, Raymond Augustine; and Papa, Anthony Joseph, 4,107,106, Cl. 521-164.000.

Papantoniou, Christos: *See*—
Jacquet, Bernard; Papantoniou, Christos; Dufaure, Pierre; and Mahieu, Claude, 4,107,290, Cl. 424-47.000.

Paragi, Edward J.: *See*—
Campbell, Donn V.; and Paragi, Edward J., 4,107,691, Cl. 343-120.000.

PARCOR: *See*—
Maffrand, Jean-Pierre; and Pereillo, Jean-Marie, 4,107,437, Cl. 544-376.000.

Pardoe, John Alan; Etherington, Clifford; and Hunter, Eric, to United Kingdom Atomic Energy Authority. Forming of materials by extrusion. 4,106,320, Cl. 72-256.000.

Paris, John Rene: *See*—
Murphy, Alan Pearce; and Paris, John Rene, 4,107,067, Cl. 252-135.000.

Parker, Phillip H., to Chevron Research Company. Needle-punched grass-like carpets. 4,107,361, Cl. 428-17.000.

Parodi, Sandro: *See*—
Giannini, Umberto; Albizzati, Enrico; and Parodi, Sandro, 4,107,416, Cl. 526-114.000.

Parsons, William H., to Teleflex Incorporated. Method and apparatus for assembling a ball cage of the type utilized in a motion transmitting remote control assembly. 4,106,168, Cl. 29-148.40C.

Parsteel Products Company, Inc.: *See*—
Rosenband, Phillip, 4,106,630, Cl. 211-191.000.

Partain, Wilbur A.; and Sudol, Frank D. Adjustable coil rack. 4,106,735, Cl. 248-119.00R.

Pasko, Edward: *See*—
Emmons, David L.; Roberts, Richard E.; Pasko, Edward; and Harmon, George Lamar, 4,106,726, Cl. 244-3.170.

Pass, Nelson S., to Threshold Corporation. Constant voltage - constant current high fidelity amplifier. 4,107,619, Cl. 330-255.000.

Patel, Jayant K., to TRW Inc. Miniature motor. 4,107,559, Cl. 310-49.00R.

Patelli, Bianca: *See*—
Arcamone, Federico; Bernardi, Luigi; Patelli, Bianca; and Penco, Sergio, 4,107,423, Cl. 536-4.000.

Paterson, Malcolm M.; Grubba, Michael R.; Cambourelis, Peter J.; and Schrimper, Vernon L., to Raytheon Company. Air screw classifier. 4,107,034, Cl. 209-135.000.

Patheiger, Manfred: *See*—
Fuhr, Karl; Troesckner, Hans-Joachim; Rosenkranz, Hans Jurgen; Rufolph, Hans; Patheiger, Manfred; and Haus, Artur, 4,107,012, Cl. 204-159.190.

Paul, Rolf; and Mosschik, Judith, to American Cyanamid Company. Imidazo [1,5-d]-as-triazine-4(3H)-ones and thiones. 4,107,307, Cl. 424-249.000.

Paul, Rolf; and Mosschik, Judith, to American Cyanamid Company. Imidazo[1,5-d]-as-triazines. 4,107,308, Cl. 424-249.000.

Paul, Rolf; and Mosschik, Judith, to American Cyanamid Company. Substituted imidazo[1,2-d]-as-triazines. 4,107,309, Cl. 424-249.000.

Pauley, Merle R.: *See*—
Brolund, Theodore F.; Scott, William B.; and Pauley, Merle R., 4,106,183, Cl. 29-564.000.

Paulus, Rudolf: *See*—
Pfeifer, Josef; Paulus, Rudolf; Gutmann, Walter; and Resch, Michael, 4,107,687, Cl. 346-107.00R.

Pause, Kurt: *See*—
Buzga, Heinrich; Steprath, Werner; and Pause, Kurt, 4,106,518, Cl. 134-104.000.

Payne, Stephen Martin: *See*—
Smith, Brian Roger; Jarvis, Charles Richard; Payne, Stephen Martin; Potts, Robert John; and Wallis, Frank, 4,106,187, Cl. 29-625.000.

Payraudeau, Daniel: *See*—
Schultz, Jean-Pierre; Cuny, Francis; Payraudeau, Daniel; and Tritz, Jean-Marie, 4,107,507, Cl. 219-121.00P.

Pearce, Peter John: *See*—
Cunliffe, Anthony Vernon; Pearce, Peter John; and Richards, David Hugh, 4,107,142, Cl. 528-93.000.

Pearson, Allen F.; Mayo, Paul A.; and Lorenz, Ronald N., to Anthes Imperial Limited. Dispensing system. 4,107,777, Cl. 364-465.000.

Pearson, Edward E. Stereophonic noise suppression system. 4,107,463, Cl. 179-1.00G.

Pearson, Tillmon H.: *See*—
Nelson, Gunner E.; and Pearson, Tillmon H., 4,107,064, Cl. 252-89.00R.

Pease, Ronald J.: *See*—
Sikma, William J.; and Pease, Ronald J., 4,106,203, Cl. 33-86.000.

Pease, William M.: *See*—
Gross, Fritz A.; Pease, William M.; Meade, John E.; and Vickers, Harry, 4,107,673, Cl. 343-5.0DP.

Pedain, Josef: *See*—
Konig, Eberhard; and Pedain, Josef, 4,107,199, Cl. 260-465.00D.
Konig, Eberhard; and Pedain, Josef, 4,107,200, Cl. 260-465.00E.

Peet, Norton P.: *See*—
Sunder, Shyam; and Peet, Norton P., 4,107,436, Cl. 544-169.000.

Pegg, Elra W.: *See*—
Zechinati, James; and Pegg, Elra W., 4,107,250, Cl. 264-118.000.

Peksa, Stanislaw: *See*—
Murza-Mucha, Pawel; Koszarewski, Zbigniew; Ostaszewski, Wojciech; and Peksa, Stanislaw, 4,106,548, Cl. 164-132.000.

Pelegri, Ismael Martinez. Soldering method. 4,107,506, Cl. 219-85.00A.

Pelton & Crane Company: *See*—
Childress, Bobby Belton, 4,106,198, Cl. 32-22.000.

Penco, Sergio: *See*—
Arcamone, Federico; Bernardi, Luigi; Patelli, Bianca; and Penco, Sergio, 4,107,423, Cl. 536-4.000.

Penez, Andre: *See*—
Recasens, Joseph; and Penez, Andre, 4,106,947, Cl. 106-57.000.

Penland Container, Inc.: *See*—
Yealy, Carl F.; and Abbott, Joseph, 4,106,963, Cl. 156-73.500.

Pennwalt Corporation: *See*—
King, James Ping; Mailey, Everett A.; and Popoff, Ivan Christoff, 4,107,059, Cl. 252-28.000.

Penzien, Klaus: *See*—
Wurmb, Rolf; Seydl, Wolfgang; Penzien, Klaus; Gausepohl, Hermann; and Sterzel, Hans-Josef, 4,107,231, Cl. 260-873.000.

PepsiCo Inc.: *See*—
Horn, John J., 4,106,243, Cl. 52-16.000.

Percarpio, Edward P., to Becton, Dickinson and Company. Multiple sample needle assembly with indicator means. 4,106,497, Cl. 128-2.00F.

Percheron born Guegen, Annick; Achard, Jean Claude; Loriers, Jean; Bonnemay, Maurice; Bronoel, Guy; Sarradin, Joel; and Schlapbach, Louis, to Agence Nationale de Valorisation de la Recherche (ANVAR). Electrode materials based on lanthanum and nickel, and electrochemical uses of such materials. 4,107,405, Cl. 429-218.000.

Percy, Roger D.; Wilding, David C. M.; and Kagan, Sholly, to R. D. Percy & Company. Television viewer reaction determining system. 4,107,734, Cl. 358-84.000.

Peregrina, Carlos Morales. Elevated support angularly adjustable on a spherical joint head and same bearing a vise. 4,106,761, Cl. 269-75.000.

Pereillo, Jean-Marie: *See*—
Maffrand, Jean-Pierre; and Pereillo, Jean-Marie, 4,107,437, Cl. 544-376.000.

Perkin-Elmer Corporation, The: *See*—
Babish, Richard Constantine, 4,106,856, Cl. 350-199.000.

Perkins, Donald W.: *See*—
Hildebrandt, Herbert J.; and Perkins, Donald W., 4,106,462, Cl. 123-148.00E.

Perkins, Warren S., to Auburn University Research Foundation. Process for recycling textile warp yarn size. 4,106,900, Cl. 8-115.600.

Perkons, George: *See*—
Moden, James R.; and Perkons, George, 4,107,406, Cl. 429-218.000.

Perma-Power Inc.: *See*—
Queen, Daniel L.; and Belt, Kenneth W., 4,107,613, Cl. 325-348.000.

Pessimisis, George N., to Nalco Chemical Company. Use of citric acid to make catalyst from catalyst fines. 4,107,087, Cl. 252-455.00R.

Peterhans, Josef; Volkert, Otto; and Beckerle, Wilhelm Friedrich, to BASF Wyandotte Corporation. Porous, substantially foam-free composites. 4,107,100, Cl. 521-137.000.

Peters, Robert W. Stator coil press. 4,106,189, Cl. 29-736.000.

Petersen, Carl Mogens, III, to Irvin Industries Inc. Safety switch. 4,107,484, Cl. 200-42.00T.

Petersen, John: *See*—
Petersen, Knud William; and Petersen, John, 4,106,589, Cl. 182-5.000.

Petersen, Knud William; and Petersen, John. Device adapted to be

fastened to a wire, a cable, a cord, or a similar flexible elongated element. 4,106,589, Cl. 182-5.000.

Petersen, Oscar Johan; and Scott, Timothy Frank, to Robertshaw Controls Company. Microorganism growth inhibitor device. 4,106,995, Cl. 195-103.50R.

Peterson, James F.; Freier, Edward, Jr.; and Burmesch, Gerald C., to Allis-Chalmers Corporation. Grass collecting multiple blade mower without auxiliary blower means. 4,106,272, Cl. 56-202.000.

Petree, Harris E.; Nabors, James B., Jr.; and Grace, Henry C., to Ciba-Geigy Corporation. Non-explosive glyoxime compositions. 4,106,927, Cl. 71-121.000.

Petricca, Anthony V., to SCM Corporation. Whippable emulsion stable at room temperature. 4,107,343, Cl. 426-564.000.

Petrich, Walter R. Folding hatchet. 4,106,539, Cl. 145-2.00A.

Petrolite Corporation: *See*—
Oude Alink, Bernardus A.; and Thompson, Neil E. S., 4,106,904, Cl. 21-2.70R.

Petruck, Gerd-Michael; Klauke, Erich; and Jager, Horst, to Bayer Aktiengesellschaft. 4-Hydroxyanthrones and process of preparation. 4,107,186, Cl. 260-351.000.

Petruzzella, Nicholas L., to Xerox Corporation. Xerographic plate having an phthalocyanine pigment interface barrier layer. 4,106,935, Cl. 96-1.50R.

Petzi, Fritz: *See*—
Baumann, Helmut; and Petzi, Fritz, 4,106,893, Cl. 432-77.000.

Pezzotti, Erio: *See*—
Ruffini, Guglielmo; and Pezzotti, Erio, 4,106,979, Cl. 162-73.000.

Pfahler, Gerhard: *See*—
Mayer, Norbert; Pfahler, Gerhard; and Wiezer, Hartmut, 4,107,139, Cl. 260-45.8NZ.

Pfefer, Irving. Demountable photo vignetting device. 4,107,716, Cl. 354-296.000.

Pfeffer, Philip E.; and Moore, Gordon G., to United States of America, Agriculture. Preparation of 1-α- and 1-β-glucose esters by stereoselective acylation of metalated 2,3,4,6,-tetra-O-benzyl-D-glucopyranose. 4,107,425, Cl. 536-119.000.

Pfeifer, Josef; Paulus, Rudolf; Gutmann, Walter; and Resch, Michael, to AGFA-Gevaert, A.G. Recording device. 4,107,687, Cl. 346-107.00R.

Pfeizer Inc.: *See*—
Cox, David A.; Gymer, Geoffrey E.; and Shroot, Braham, 4,107,314, Cl. 424-263.000.

Pfirrmann, Rolf W., to Ed. Geistlich Sohne A.G. fur Chemische Industrie. Treatment of endotoxaemia. 4,107,305, Cl. 424-246.000.

Pfister, Gustav R.: *See*—
Conwell, Esther M.; Kermisch, Dorian; Maher, James C.; Pfister, Gustav R.; and Schank, Richard L., 4,106,848, Cl. 350-96.140.

Pfizer Inc.: *See*—
Jolly, Ramesh C., 4,107,334, Cl. 426-7.000.
Kuhla, Donald E.; and Watson, Harry A., Jr., 4,107,430, Cl. 542-471.000.
Ross, Barry C., 4,107,435, Cl. 544-97.000.

PGP Industries Inc.: *See*—
Baltz, John; and Coltrinari, Enzo, 4,107,261, Cl. 423-22.000.

Pharmaceutical Society of Victoria: *See*—
Oppenheim, Richard Charles; Marty, Jennifer Joy; and Speiser, Peter, 4,107,288, Cl. 424-22.000.

Phillips, Benjamin A., to Allied Chemical Corporation. Analyzer and rectifier method and apparatus for absorption heat pump. 4,106,309, Cl. 62-476.000.

Phillips, Irvin J., to Beloit Corporation. Air knife with adjustable lip. 4,106,429, Cl. 118-63.000.

Phillips Petroleum Company: *See*—
Campbell, Robert W.; and Cleary, James W., 4,107,150, Cl. 528-307.000.
Carroll, James C.; and Johnson, Lewis T., 4,106,623, Cl. 206-506.000.
Carroll, James C.; and Johnson, Lewis T., 4,106,625, Cl. 206-507.000.
Carrow, Guy E., 4,106,745, Cl. 249-97.000.
LaSpisa, Ronald J., 4,107,246, Cl. 264-40.700.
Naylor, Floyd E.; and Zelinski, Robert P., 4,107,236, Cl. 260-879.000.
Richards, Frank P.; and Young, Jerry W., 4,106,396, Cl. 93-36.50R.
Salmon, Emigdio J., 4,107,422, Cl. 528-502.000.
Tuckett, William F.; Funk, Gary L.; and Smith, Dexter E., 4,106,916, Cl. 55-21.000.
Welch, M. Bruce, 4,107,412, Cl. 526-114.000.

Pichon, Maurice: *See*—
Brochier, Michel; and Pichon, Maurice, 4,107,020, Cl. 204-251.000.

Pickett, Frederick P.: *See*—
Lawrence, James L., Jr.; Holzl, Robert A.; and Pickett, Frederick P., 4,106,744, Cl. 249-96.000.

Piehl, Julia A., legal representative: *See*—
Piehl, Otto W., deceased, 4,106,206, Cl. 33-199.00R.

Piehl, Otto W., deceased (by Piehl, Julia A., legal representative), to United States of America, Navy. Positively expandable and retractable thread measuring gage. 4,106,206, Cl. 33-199.00R.

Pieper, Helmut, to Sorg GmbH & Co. KG. Method and apparatus for measuring the temperature of molten masses. 4,107,446, Cl. 13-6.000.

Pieper, Helmut, to Sorg GmbH & Co. KG. Electrical glass melting furnace. 4,107,447, Cl. 13-6.000.

Pierce, Ben Arthur, to Dracon Industries. Two-way paging system transmission direction sensing and control apparatus and method. 4,107,473, Cl. 179-18.0BF.

Pierson, John Ronald: *See*—
Dougherty, Thomas John; Hennen, Roy Erving; and Pierson, John Ronald, 4,107,402, Cl. 429-120.000.

Piguet, Christian: *See*—
Martin, Jean-Claude; and Piguet, Christian, 4,106,279, Cl. 58-23.0BA.

Piltingsrud, Harley V. Plutonium-americium detection probe with frontal light-guide-diffuser. 4,107,534, Cl. 250-368.000.

Pioneer Electronic Corporation: *See*—
Sugai, Yoshiro, 4,107,614, Cl. 325-348.000.

Pirogov, Nikolai Alexeevich: *See*—
Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pirogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Borisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; Shevtsov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich; Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mateshin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich; Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich; Koen, David Matveevich; Seleverstov, Vladimir Vasilievich; Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pizogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Bozisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zakharovich, 4,107,449, Cl. 13-35.000.

Pisani, Luigi, to Officina Meccanica Pisani Luigi. Rolling-up machine for lengths of cloth destined for collar-cutting machines. 4,106,715, Cl. 242-57.100.

Pissiotas, Georg: *See*—
Rohr, Otto; Pissiotas, Georg; and Bohner, Beat, 4,106,925, Cl. 71-108.000.

Pittet, Alan O.: *See*—
Schreiber, William L.; and Pittet, Alan O., 4,107,217, Cl. 260-615.00A.

Pizogov, Nikolai Alexeevich: *See*—
Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pirogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Borisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; Shevtsov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich; Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mateshin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich; Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich; Koen, David Matveevich; Seleverstov, Vladimir Vasilievich; Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pizogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Bozisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zakharovich, 4,107,449, Cl. 13-35.000.

Plamondon, Joseph E.; Wilber, William R.; and Goth, Stephen, to Rohm and Haas Company. Heteropolymer acrylic latices and textiles treated therewith. 4,107,120, Cl. 260-29.6RB.

Plass, Ludolf: *See*—
Reh, Lothar; Plass, Ludolf; and Marchessaux, Philippe, 4,107,281, Cl. 423-625.000.

Platonov, Mikhail Alexandrovich; and Pokrovsky, Grigory Vasilievich. Method of producing moulded parts. 4,106,321, Cl. 72-348.000.

Plattner Industries, Inc.: *See*—
Cannon, John Porter, 4,106,665, Cl. 220-329.000.

Plattner, Werner, administrator: *See*—
Kaiser, Fritz; Schaumann, Wolfgang; Stach, Kurt, deceased; Plattner, Werner, administrator; and Voightlander, Wolfgang, 4,107,299, Cl. 424-182.000.

Plockl, Johann. Arrangement for reading out an optical memory. 4,107,702, Cl. 354-17.000.

Pneutek, Inc.: *See*—
Haytayan, Harry M., 4,106,619, Cl. 206-346.000.

Poclain, Societe Anonyme: *See*—
Manesse, Jean-Pierre Andre, 4,106,522, Cl. 137-512.000.

Pohl, Gerhard: *See*—
Knorre, Helmut; Fischer, Joachim; and Pohl, Gerhard, 4,107,274, Cl. 423-268.000.

Pointon, David Wellings: *See*—
Reed, Kenneth James; and Pointon, David Wellings, 4,107,365, Cl. 428-202.000.

Pokallus, Leonard W.: *See*—
Clishem, Thomas A.; Olympia, Frederick D.; and Pokallus, Leonard W., 4,107,255, Cl. 264-299.000.

Pokrovsky, Grigory Vasilievich: *See*—
Platonov, Mikhail Alexandrovich; and Pokrovsky, Grigory Vasilievich, 4,106,321, Cl. 72-348.000.

Polaroid Corporation: *See*—
Brewer, William R.; Norland, Kenneth S.; and Wright, Richard F., 4,106,861, Cl. 350-354.000.
Evans, David H.; and Greenwald, Richard B., 4,107,176, Cl. 260-327.00M.
Scholz, Donald T., 4,106,863, Cl. 352-72.000.

Politechnika Warszawska: *See*—
Murza-Mucha, Pawel; Koszarewski, Zbigniew; Ostaszewski, Wojciech; and Peksa, Stanislaw, 4,106,548, Cl. 164-132.000.

Polley, Joseph A. Solar energy reflecting system. 4,106,485, Cl. 126-271.000.

Polstorff, Walter K., to United States of America, National Aeronautics and Space Administration. Simulator method and apparatus for practicing the mating of an observer-controlled object with a target. 4,106,218, Cl. 35-12.00C.

Polukhin, Alexandr Nikolaevich: *See—*
Moiseev, Vladimir Vasilievich; Kosovtsev, Vladimir Vasilievich; Kolesnikova, Galina Prokofievna; Esina, Tamara Ivanovna; Polukhin, Alexandr Nikolaevich; and Zimnukhov, Viktor Alexandrovich, 4,107,141, Cl. 528-129.000.

Polysar Limited: *See—*
Richmond, Michael Hugh, 4,107,252, Cl. 264-176.00F.

Polysar Resins, Inc.: *See—*
Toekes, Barna, 4,107,410, Cl. 526-73.000.

Poncet, Pierre. Hydraulic moulding presses. 4,106,885, Cl. 425-450.100.

Popoff, Ivan Christoff: *See—*
King, James Ping; Mailey, Everett A.; and Popoff, Ivan Christoff, 4,107,059, Cl. 252-28.000.

Porchey, David V.: *See—*
Scamehorn, John F.; and Porchey, David V., 4,107,421, Cl. 528-483.000.

Porritt, Derek S.: *See—*
Greenwald, A. Seth; Porritt, Derek S.; and Matejczyk, Mary-Blair, 4,106,128, Cl. 3-1.910.

Porter, William F., to United States Gypsum Company. Apparatus for low pressure air fiberization of mineral fiber. 4,106,921, Cl. 65-14.000.

Porter, William R.: *See—*
Borcher, Charles A.; and Porter, William R., 4,106,410, Cl. 102-67.000.
Borcher, Charles A.; Porter, William R.; and Harris, Martin H., 4,106,411, Cl. 102-67.000.

Post, David L.: *See—*
Schuler, Alan L.; and Post, David L., 4,106,424, Cl. 114-74.00A.

Post Office, The: *See—*
Redshaw, Digby, 4,107,481, Cl. 179-164.000.

Potomac Applied Mechanics, Inc.: *See—*
Stubbings, James Henry, 4,106,380, Cl. 83-212.000.

Potter, Bobby R.; and Scott, Allan W., to United States of America, Army. Printed circuit traveling wave tube. 4,107,573, Cl. 315-3.500.

Potts, Robert John: *See—*
Smith, Brian Roger; Jarvis, Charles Richard; Payne, Stephen Martin; Potts, Robert John; and Wallis, Frank, 4,106,187, Cl. 29-625.000.

Powell, Norman F., to Westinghouse Electric Corp. Polarization correlation target seeker. 4,107,678, Cl. 343-7.0ED.

PPG Industries, Inc.: *See—*
Rieser, Raymond G.; and Chabal, Joseph, 4,107,366, Cl. 428-215.000.
Sickles, James E.; Hornyak, Joseph V.; and Franz, Helmut, 4,106,697, Cl. 239-15.000.

Praporov, Anatoly Mikhailovich: *See—*
Kucherenko, Vladimir Ilich; Flerov, Valery Nikolaevich; Korolev, Georgy Vladimirovich; Kotov, Evgeny Pavlovich; Praporov, Anatoly Mikhailovich; Batova, Galina Alexandrovna; Melikova, Gayane Leonovna; and Kolomeichuk, Alexandr Ivanovich, 4,107,011, Cl. 204-151.000.

Pratt, Frederick P.; and Gagnon, David L., to New England Nuclear Corporation. Tracer for circulation determinations. 4,107,283, Cl. 424-1.000.

Precision Metalsmiths, Inc.: *See—*
Erndt, Edmund E., 4,106,945, Cl. 106-38.300.

Preikschat, Fritz K. Electrode for an impedance measuring apparatus. 4,107,599, Cl. 324-61.00R.

Preiss, Michael: *See—*
Schrock, Wilfried; Konig, Hans-Bodo; Preiss, Michael; Metzger, Karl Georg; and Walkowiak, Michael, 4,107,304, Cl. 424-246.000.

Prichard, Daniel Ray: *See—*
Weigand, Rex Olen; McMillen, Kenneth Ray; Fulk, Ronald Dean; Prichard, Daniel Ray; and Kountz, Jack Merriel, 4,106,270, Cl. 56-98.000.

Priola, Aldo; Cesca, Sebastiano; and Ferraris, Giuseppe, to Snamprogetti, S.p.A. Process for the production of polymers and copolymers of isobutylene. 4,107,417, Cl. 526-117.000.

Procter & Gamble Company, The: *See—*
Murphy, Alan Pearce; and Paris, John Rene, 4,107,067, Cl. 252-135.000.
Sisson, James Bryant, 4,107,364, Cl. 428-196.000.

Proctor, Leonard R.; and Byrnes, Raymond G., to United States of America, Health, Education and Welfare. Biphasic otoscopic air stimulator for performing clinical caloric tests. 4,106,493, Cl. 128-2.00R.

Proctor, Leonard R.; Dix, Rollin C.; and Metz, Werner A., to United States of America, Health, Education and Welfare. Method and apparatus for air caloric testing for the evaluation or aural vestibular disorders. 4,106,496, Cl. 128-2.00R.

Producers Row Inc.: *See—*
Chasins, Edward A., 4,106,852, Cl. 350-117.000.

Prokai, Bela; and Kanner, Bernard, to Union Carbide Corporation. Acrylonitrile-capped polyether-siloxanes. 4,107,068, Cl. 252-182.000.

Proux, Yves; and Julien, Christian, to Societe Francaise d'Organo Synthese. Phenolic antioxidants for synthetic polymers. 4,107,137, Cl. 260-45.85T.

Pucel, Robert A.; and Benjamin, James A., to Raytheon Company. Overlay metallization multi-channel high frequency field effect transistor. 4,107,720, Cl. 357-22.000.

Pullman Berry Company: *See—*
Rymarchyk, Nicholas M.; and Meinert, Leo L., 4,106,756, Cl. 266-99.00R.

Pullman Incorporated: *See—*
Ennis, Bernard P., Jr.; and Styslinger, James R., 4,107,226, Cl. 260-683.00R.

PUMA-Sportschunfabriken Rudolf Dassler KG.: *See—*
Benseler, Hans, 4,106,223, Cl. 36-117.000.

Purpi, David C.: *See—*
Turnbo, Roy G.; and Purpi, David C., 4,107,230, Cl. 260-861.000.

Pury, Thomas; Assa, Menachem; and Wagner, Howard R., to General Electric Company. Power assist device using strain responsive means. 4,107,590, Cl. 318-628.000.

Puyplat, Olivier, to Cibie Projecteurs. Method for assembling together parts of automobile lights. 4,106,969, Cl. 156-275.000.

Quaas, Dietmar G.: *See—*
Lang, Richard L.; and Quaas, Dietmar G., 4,106,633, Cl. 214-1.0BB.

Quaker Oats Company, The: *See—*
Greenberg, Michael J., 4,107,342, Cl. 426-535.000.

Queen, Daniel L.; and Belt, Kenneth W., to Perma-Power Inc. Wireless microphone with FM receiver muting system responsive to excessive undesired AM level or low AGC control level. 4,107,613, Cl. 325-348.000.

Quick-Rotan Becker & Notz KG: *See—*
Bayer, Friedrich, 4,107,592, Cl. 318-568.000.

Quinn, Clayton B., to General Electric Company. Process for preparing dihydroxydiphenyl chloroethylenes. 4,107,442, Cl. 568-726.000.

Quinn, Edwin J.: *See—*
Dieck, Ronald L.; and Quinn, Edwin J., 4,107,108, Cl. 521-85.000.
Dieck, Ronald L.; Magnusson, Alan B.; and Quinn, Edwin J., 4,107,146, Cl. 528-168.000.

Quintal, Yvan. Ground heat exchanger. 4,106,555, Cl. 165-45.000.

R. D. Percy & Company: *See—*
Frohbach, Hugh F., 4,107,735, Cl. 358-84.000.
Percy, Roger D.; Wilding, David C. M.; and Kagan, Sholly, 4,107,734, Cl. 358-84.000.

Raab, Karl-Heinz, to Jos. Schneider & Co. Optische Werke. Adjusting mechanism for movable picture-taking objective. 4,107,714, Cl. 354-196.000.

Rabas, Thomas J.: *See—*
Ritland, Paul D.; and Rabas, Thomas J., 4,106,559, Cl. 165-111.000.

Rademacher, Karl August: *See—*
Heinrich, Hans Juergen; Rademacher, Karl August; Strohn, Helmut; and Kramer, Friedhelm, 4,107,042, Cl. 210-225.000.

Radiochemical Centre Limited, The: *See—*
Charlton, John Cecil; Glover, John Stuart; and Shepherd, Bryan Peter, 4,106,907, Cl. 23-230.300.

Raguin, Michel M.: *See—*
Joyce, Thomas F.; and Raguin, Michel M., 4,107,774, Cl. 364-200.000.

RAI Research Corporation: *See—*
D'Agostino, Vincent F.; Lee, Joseph Y.; and Cook, Edward H., Jr., 4,107,005, Cl. 204-98.000.

Railoc Company, Inc.: *See—*
Rutten, Peter T., 4,106,252, Cl. 52-762.000.

Rajagopalan, Parthasarathi; and Pachter, Irwin J., to Endo Laboratories. Tris[tetrahydroisoquinoline] compounds. 4,107,165, Cl. 260-288.0CE.

Ralph, John Ernest, to U.S. Philips Corporation. Surface controlled field effect solid state device. 4,107,724, Cl. 357-30.000.

Ramun, Michael. Shearing tool for structural members. 4,106,682, Cl. 225-103.000.

Randall, James R.; Langhurst, Arling K.; Schopmeyer, Herman H.; and Seaton, Robert L., to Archer Daniels Midland Company. Continuous steeping of corn for wet processing to starches, syrups and feeds. 4,106,487, Cl. 127-23.000.

Randmer, Jacob A.: *See—*
Koller, Thomas J.; and Randmer, Jacob A., 4,107,562, Cl. 313-59.000.

Rank Organisation Limited, The: *See—*
Cooper, Peter Raymond, 4,107,517, Cl. 250-199.000.
Moore, William Thomas; and Heftman, George, 4,106,845, Cl. 350-6.600.

Rank Precision Industries, Inc.: *See—*
Thiel, William A.; and Dziedzic, Harry, 4,107,763, Cl. 362-32.000.

Ransburg Corporation: *See—*
DeVittorio, Joseph M., 4,106,964, Cl. 156-75.000.

Ranz, Erwin: *See—*
Langen, Hans; Ranz, Erwin; Eibl, Johannes; and Wolf, Walther, 4,106,940, Cl. 96-74.000.

Rapperswill Corporation: *See—*
Korf, Heinz Ludwig, 4,107,105, Cl. 521-80.000.

Raschig G.m.b.H.: *See—*
Braun, Roland, 4,107,241, Cl. 261-79.00A.

Ratcliffe, Walter James; Kolb, Robert W.; and Bruce, S. Esson, to Dominion Textile Limited. Water repellant fabrics. 4,107,368, Cl. 428-245.000.

Rauma-Repola Oy: *See—*
Lindberg, Jarl Johan; Turunen, Johannes; and Hortling, Bo, 4,107,111, Cl. 260-17.500.
Saikku, Antti Tuomas, 4,106,537, Cl. 144-34.00R.

Raygo Wagner, Inc.: *See—*
Weisgerber, Charles E., 4,106,646, Cl. 214-147.00R.

Raymond Lee Organization, Inc., The: *See—*
Bennett, Cleatus W., 4,107,693, Cl. 343-715.000.
Raytheon Company: *See—*
Gross, Fritz A.; Pease, William M.; Meade, John E.; and Vickers, Harry, 4,107,673, Cl. 343-5.0DP.
Hutcheon, Robert Stewart; and Gordon, Bruce E., 4,107,692, Cl. 343-120.000.
Ironfield, Richard, 4,107,501, Cl. 219-10.55B.
Martin, Walter J.; and Furtado, John, 4,107,685, Cl. 343-100.0SA.
Paterson, Malcolm M.; Grubbs, Michael R.; Cambourelis, Peter J.; and Schrimper, Vernon L., 4,107,034, Cl. 209-135.000.
Pucel, Robert A.; and Benjamin, James A., 4,107,720, Cl. 357-22.000.
Schilling, Hartmut, 4,107,726, Cl. 357-71.000.
Tyson, Charles H., 4,106,840, Cl. 339-145.00R.
Razvi, Masood H. Electrically conductive pipe fitting. 4,107,452, Cl. 174-84.00S.
RCA Corporation: *See—*
Gubitose, Nicholas Francis; and James, Robert Arthur, 4,106,532, Cl. 140-147.000.
James, Edward Anthony; and Kuznetzoff, Philip, 4,107,351, Cl. 427-43.000.
Jellinek, Ernest, 4,107,689, Cl. 343-112.0TC.
Kaplan, Gerald Stanley, 4,107,680, Cl. 343-8.000.
Stewart, Roger Green; and Eaton, Sargent Sheffield, Jr., 4,107,556, Cl. 307-362.000.
Recasens, Joseph; and Penez, Andre, to Societe Europeenne des Produits Refractaires. Beads of ceramic material. 4,106,947, Cl. 106-57.000.
Redshaw, Digby, to Post Office, The. Telephone instruments. 4,107,481, Cl. 179-164.000.
Reed, Clarence Arthur: *See—*
Morgan, Lewis Coleman; and Reed, Clarence Arthur, 4,107,694, Cl. 343-715.000.
Reed, Joseph, to International Telephone & Telegraph Corp. Frequency division multiplex communications system. 4,107,471, Cl. 179-15.0FD.
Reed, Kenneth James; and Pointon, David Wellings, to E. T. Marler Limited. Improvements in textile transfers. 4,107,365, Cl. 428-202.000.
Reed, Russell, Jr.: *See—*
Moore, Kenneth L.; and Reed, Russell, Jr., 4,106,906, Cl. 21-60.50A.
Reed Tool Co.: *See—*
Stone, Charles W., 4,106,571, Cl. 173-64.000.
Reeder, George Elwood, Jr. Expandable internal chuck. 4,106,720, Cl. 242-68.400.
Reens, Louis H.: *See—*
Spilman, Raymond; Haase, Edward Emil, Jr.; Kruger, Kurt John; Budnick, Donald Barry; and Lasorso, Vincent John, Jr., 4,106,490, Cl. 128-2.00F.
Regent of the University of California: *See—*
Evans, David A., 4,107,181, Cl. 260-340.90R.
Regie Nationale des Usines Renault: *See—*
Bouvet, Jean-Marie, 4,106,367, Cl. 74-866.000.
Ducret, Alain; and Chalesle, Andre Maurice, 4,106,827, Cl. 308-187.100.
Reh, Lothar; Plass, Ludolf; and Marchessaux, Philippe, to Aluminum Pechiney. Process for the thermal decomposition of aluminum chloride hexahydrate to obtain alumina. 4,107,281, Cl. 423-625.000.
Reid, Brian C. Electric cable insulating compositions containing coconut shell flour filler. 4,107,383, Cl. 428-379.000.
Reiff, Helmut: *See—*
Traubel, Harro; Reiff, Helmut; and Dieterich, Dieter, 4,106,897, Cl. 8-94.330.
Traubel, Harro; Reiff, Helmut; and Dieterich, Dieter, 4,106,898, Cl. 8-94.330.
Reikel, Robert H: *See—*
Martinez, Eugene E., 4,106,230, Cl. 40-158.00R.
Reinhard, Donald Lewis: *See—*
Haaf, William Robert; and Reinhard, Donald Lewis, 4,107,232, Cl. 260-876.00R.
Reinshagen, Hellmuth: *See—*
Egger, Helmut; and Reinshagen, Hellmuth, 4,107,164, Cl. 544-380.000.
Reisender, Elizabeth A.: *See—*
Marshall, Vincent P.; Elrod, David W.; Koert, James M.; Reisender, Elizabeth A.; and Wiley, Paul F., 4,106,994, Cl. 195-80.00R.
Reisman, Arnold: *See—*
Berkenblit, Melvin; Chan, See Ark; Reisman, Arnold; and Zirinsky, Stanley, 4,106,975, Cl. 156-628.000.
Reliable Electric Company: *See—*
Paluch, Edward S., 4,106,837, Cl. 339-98.000.
Renbarger, Jerry J.; and Yonan, Peter K., to G. D. Searle & Co. α-Aryl-α,α-bis[Ω-(disubstituted amino)alkyl]acetamides and related compounds. 4,107,205, Cl. 260-558.00A.
Renk, Richard John; and Boller, George Earl, to Miller, Gladys D. Closure. 4,106,664, Cl. 220-329.000.
Renziehausen, Horst: *See—*
Langheinrich, Klaus; Berenstecher, Otto; and Renziehausen, Horst, 4,106,903, Cl. 8-196.000.
Repik, Albert J.; Miller, Charles E.; and Johnson, Homer R., to Westvaco Corporation. Process for activating carbonaceous material. 4,107,084, Cl. 252-445.000.

Republic Tool & Manufacturing Corp.: *See—*
McRoskey, John W.; McRoskey, Leonard H.; and Swartz, Delbert D., 4,106,704, Cl. 239-685.000.
Resch, Michael: *See—*
Pfeifer, Josef; Paulus, Rudolf; Gutmann, Walter; and Resch, Michael, 4,107,687, Cl. 346-107.00R.
Research Engineeering & Manufacturing, Inc.: *See—*
Ferguson, Peter J., 4,106,877, Cl. 403-14.000.
Reusser, Fritz: *See—*
Hoeksema, Herman; Reusser, Fritz; and Wait, Donald R., 4,107,295, Cl. 424-120.000.
Hoeksema, Herman; and Reusser, Fritz, 4,107,296, Cl. 424-121.000.
Rexnord Inc.: *See—*
Butzow, Neil W.; and Harris, Bernhard, 4,107,381, Cl. 428-365.000.
Reynolds Metals Company: *See—*
Hinrichs, Donald R., 4,106,330, Cl. 73-37.700.
Rhee, Seong Kwan: *See—*
Bode, James Daniel; and Rhee, Seong Kwan, 4,107,018, Cl. 204-195.00S.
Rheem Manufacturing Company: *See—*
Conrad, William A., 4,106,263, Cl. 53-97.000.
Rhodes, William A. Unidirectional horizontal seismometer. 4,107,643, Cl. 340-17.00R.
Rhone-Poulenc Industries: *See—*
Chevallier, Yvonick; Martinaud, Jacques-Pierre; Meiller, Francois; and Berthoux, Jean, 4,107,079, Cl. 252-429.00R.
Violland, Robert; and Lagasse, Alain, 4,107,056, Cl. 252-8.800.
Rice, Edwin Eugene; and Vliet, Walter Carl, to Ingersoll-Rand Company. Method and apparatus for fastener tensioning. 4,106,176, Cl. 29-407.000.
Rice, Warren A.: *See—*
Torbet, Christopher J.; Rice, Warren A.; and Vinton, Clarence S., 4,106,970, Cl. 156-306.000.
Rich, C. Allen: *See—*
Jalil, Asjed A.; and Rich, C. Allen, 4,106,519, Cl. 134-122.00R.
Richards, Clyde N. Linear insulator with alternating nonconductive sheds and conductive shields. 4,107,455, Cl. 174-140.00R.
Richards, David Hugh: *See—*
Cunliffe, Anthony Vernon; Pearce, Peter John; and Richards, David Hugh, 4,107,142, Cl. 528-93.000.
Richards, Frank P.; and Young, Jerry W., to Phillips Petroleum Company. Apparatus for forming a container having a rolled rim. 4,106,396, Cl. 93-36.50R.
Richardson, James E.: *See—*
Fisher, Leonard; and Richardson, James E., 4,106,193, Cl. 30-172.000.
Richmond, Michael Hugh, to Polysar Limited. Melt spinning synthetic filaments. 4,107,252, Cl. 264-176.00F.
Richt, Oskar Hubert. Drive unit for magnetic tape-recorders. 4,106,725, Cl. 242-201.000.
Ricoh Company, Ltd.: *See—*
Suzuki, Takami; and Iwata, Nobuo, 4,106,611, Cl. 400-144.200.
Tani, Tatsuo; and Kameyama, Toshiaki, 4,106,763, Cl. 271-9.000.
Ridge, George W.: *See—*
Carey, Thomas A.; and Ridge, George W., 4,106,271, Cl. 56-119.000.
Riebel, Hans-Jochem: *See—*
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Hammann, Ingeborg; and Behrenz, Wolfgang, 4,107,301, Cl. 424-200.000.
Riegel, Herbert: *See—*
Sze, Morgan C.; Riegel, Herbert; and Schindler, Harvey D., 4,107,222, Cl. 260-659.00A.
Ries, Karl: *See—*
Lather, Dieter; and Ries, Karl, 4,106,326, Cl. 73-1.0DV.
Rieser, Raymond G.; and Chabal, Joseph, to PPG Industries, Inc. Glass-plastic laminates. 4,107,366, Cl. 428-215.000.
Rieter Machine Works Ltd.: *See—*
Oswald, Heinz; and Wust, Olivier, 4,106,711, Cl. 242-19.000.
Riew, Changkiu Keith; Siebert, Alan R.; and Rowe, Eugene H., to B. F. Goodrich Company, The. Epoxy resin plastics. 4,107,116, Cl. 260-23.0EP.
Riffiod, Michel: *See—*
Strauch, Raymond; and Riffiod, Michel, 4,107,679, Cl. 343-7.500.
Riley, Bruce G. Light display. 4,107,764, Cl. 362-35.000.
Riley, Joseph Vincent: *See—*
Drejza, John Edward; and Riley, Joseph Vincent, 4,106,873, Cl. 400-470.000.
Ringel, Samuel M.: *See—*
Connor, David T.; Ringel, Samuel M.; and von Strandtmann, Maximilian, 4,107,429, Cl. 542-447.000.
Ritland, Paul D.; and Rabas, Thomas J., to Westinghouse Electric Corp. Tube side flow control device for moisture separator reheaters. 4,106,559, Cl. 165-111.000.
Ritze, Willi, to Jenaer Glaswerk Schott & Gen. Steep absorption edge filter glass. 4,106,946, Cl. 106-52.000.
Robert Bosch GmbH: *See—*
Bernhardt, Walter; and Ziegler, Bodo, 4,106,465, Cl. 123-179.00H.
Haas, Lothar; Brautigam, Rolf; and Weckenmann, Albert, 4,107,555, Cl. 307-308.000.
Klotzner, Winfried; Daumer, Rolf; Busse, Wolfgang; and du Mont, Hans-Christoph, 4,107,717, Cl. 364-431.000.
Seiler, Hartmut, 4,107,588, Cl. 318-484.000.
Robert, Daniel, to Societe de Constructions Mecaniques de Creil-COMEC. Method of handling bars. 4,106,647, Cl. 214-152.000.
Robert, Jacques: *See—*
Dargent, Bruno; and Robert, Jacques, 4,106,858, Cl. 350-332.000.

Roberts, Patrick S., to Thomas International Corporation. Digital arpeggio generating device. 4,106,385, Cl. 84-1.240.
Roberts, Richard E.: *See—*
Emmons, David L.; Roberts, Richard E.; Pasko, Edward; and Harmon, George Lamar, 4,106,726, Cl. 244-3.170.
Roberts, Thomas J. Contamination prevention device for sitz bath. 4,106,133, Cl. 4-6.000.
Roberts, William E., to Addressograph Multigraph Corporation. Contact printer holder. 4,106,871, Cl. 355-99.000.
Robertshaw Controls Company: *See—*
Katchka, Jay R., 4,106,889, Cl. 431-46.000.
Moon, William T., Jr.; Rogers, Arden D.; Goff, Clifford E.; and Bannon, Harry B., 4,107,492, Cl. 200-81.90M.
Petersen, Oscar Johan; and Scott, Timothy Frank, 4,106,995, Cl. 195-103.50R.
Wolfe, Denis G.; and Berryhill, Richard J., 4,106,359, Cl. 74-424.80R.
Robertson, George H.; Lazar, Melvin E.; Krochta, John M.; Farkas, Daniel F.; and Bomben, John L., to United States of America, Agriculture. Method of removing corn from the cob. 4,107,340, Cl. 426-481.000.
Robertson, Roy E.; and Weber, Robert J., to Rockwell International Corporation. Method and apparatus for automatically adjusting the resolution of a radio altimeter over its operating altitude range. 4,107,681, Cl. 343-12.00A.
Robinson, John William: *See—*
Whittington, Billy J.; Robinson, John William; and Dietrich, Ralph N., 4,106,384, Cl. 84-1.190.
Rochester Instrument Systems Limited: *See—*
Tomlinson, Colin Henry, 4,106,690, Cl. 236-46.00R.
Rochla, Kurt, to Windmoller & Holscher. Method and apparatus for producing stacks of folded bags. 4,106,395, Cl. 93-35.00R.
Rockwell International Corporation: *See—*
Anders, Ronald J., 4,106,880, Cl. 408-1.00R.
Christe, Karl O.; Shack, Carl J.; and Wilson, Richard D., 4,107,275, Cl. 423-276.000.
Eshghy, Siavash; Hall, George D.; and Hammerle, Dennis R., 4,106,570, Cl. 173-12.000.
Jenkins, James R., 4,107,469, Cl. 179-15.0BW.
Moll, Eberhard, 4,106,344, Cl. 73-431.000.
Robertson, Roy E.; and Weber, Robert J., 4,107,681, Cl. 343-12.00A.
Schoeneweis, E. Frederick, 4,106,170, Cl. 29-157.10R.
Roetger, Heinrich: *See—*
Hauschild, Ulrich; and Roetger, Heinrich, 4,106,922, Cl. 71-42.000.
Roger, Jean, to Aciers et Outillage Peugeot. Current limiting device for an a.c. motor. 4,107,584, Cl. 318-227.000.
Rogers, Arden D.: *See—*
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Rogers, Ramona. Solar heat collector. 4,106,479, Cl. 126-270.000.
Rohm and Haas Company: *See—*
DeWitt, Walter Groesbeck, III, 4,107,235, Cl. 260-876.00R.
Haag, Thomas H.; Brendley, William H., Jr.; and Martorano, Richard, 4,106,421, Cl. 113-120.00A.
Plamondon, Joseph E.; Wilber, William R.; and Goth, Stephen, 4,107,120, Cl. 260-29.6RB.
Rohr, Otto; Pissiotas, Georg; and Bohner, Beat, to Ishihara Sangyo Kaisha Ltd. Novel herbicidally active, nuclear-substituted phenoxy-phenoxy-alkanecarboxylic acid derivatives and use thereof for controlling grass-like weeds. 4,106,925, Cl. 71-108.000.
Rohrmann, Charles A., to Battelle Memorial Institute. Oxidation of hydrogen halides to elemental halogens with catalytic molten salt mixtures. 4,107,280, Cl. 423-502.000.
Rollei-Werke Franke & Heidecke: *See—*
Greger, Paul, 4,107,713, Cl. 354-209.000.
Sobotta, Reinhard, 4,106,867, Cl. 353-114.000.
Rollmann, Louis Deane, to Mobil Oil Corporation. Preparation of zeolite ZSM-35. 4,107,195, Cl. 260-448.00C.
Rolls-Royce Limited: *See—*
Dinsdale, Raymond, 4,107,504, Cl. 219-69.00E.
Romanauski, James A.: *See—*
Sellers, John C.; and Romanauski, James A., 4,107,675, Cl. 343-6.5LC.
Romashko, Nikolai Ivanovich: *See—*
Moshnin, Evgeny Nikolaevich; Nistratov, Alexei Fedorovich; Odnodushny, Viktor Alexeevich; Romashko, Nikolai Ivanovich; and Schlyakhin, Nikolai Pavlovich, 4,106,322, Cl. 72-356.000.
Ronde, Hubertus Joseph, to U.S. Philips Corporation. Color selection means comprising lens electrodes spaced by grains of insulating material. 4,107,569, Cl. 313-402.000.
Roper, Robert; and Langer, Arthur W., Jr., to Exxon Research & Engineering Co. Graft copolymerization process. 4,107,238, Cl. 260-880.00R.
Roqueta, Eduardo Caro, to Buildinter AG. Jack for stressing concrete re-inforcement elements. 4,106,752, Cl. 254-29.00A.
Rosen, Howard N., to United States of America, Agriculture. Wood impingement dryer. 4,106,215, Cl. 34-217.000.
Rosen, Perry: *See—*
Gallo-Torres, Hugo; Hamilton, James Guthrie; Rosen, Perry; and Sullivan, Ann Clare, 4,107,188, Cl. 260-397.100.
Rosenband, Phillip, to Parsteel Products Company, Inc. Storage rack assembly. 4,106,630, Cl. 211-191.000.
Rosenberg, Max. Zinc chelating fungicidal composition. 4,107,331, Cl. 424-319.000.
Rosenblatt, Girard B., Jr.: *See—*
Mendelsohn, Morris A.; Rosenblatt, Girard B., Jr.; and Meier, Joseph F., 4,107,107, Cl. 521-106.000.
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Fuhr, Karl; Traenckner, Hans-Joachim; Rosenkranz, Hans Jurgen; Rufolph, Hans; Patheiger, Manfred; and Haus, Artur, 4,107,012, Cl. 204-159.190.
Rosenthal, Richard R.; and French, Joseph, to Rosenthal, Richard R. Metering system for stimulating bronchial spasm. 4,106,503, Cl. 128-194.000.
Rosiak, Marion: *See—*
Bodine, Richard Hill, Jr.; and Rosiak, Marion, 4,107,579, Cl. 315-205.000.
Ross, Barry C., to Pfizer Inc. Process for ω-amino-2-hydroxyalkyl derivatives of aminoglycoside antibiotics. 4,107,435, Cl. 544-97.000.
Rossarie, Jean; and Maurin, Jean. Method of purifying a hydrogenated gas containing acid gases. 4,107,269, Cl. 423-222.000.
Rossi, John P.; and Stern, Marvin A., to CBS Inc. System utilizing integration and motion evaluation for reducing noise in video signal. 4,107,739, Cl. 358-167.000.
Roth, Martin: *See—*
Baumann, Marcus; Kvita, Vratislav; Roth, Martin; and Waterhouse, John Sidney, 4,107,174, Cl. 260-326.0NS.
Rotramel, Richard A.; and Fisher, Charles Michael, to Rotramel, Richard A. Musical stringed instrument. 4,106,386, Cl. 84-256.000.
Roussel Uclaf: *See—*
Allais, Andre; Clemence, Francois; Deraedt, Roger; and Le Martret, Odile, 4,107,310, Cl. 424-258.000.
Rowe, Eugene H.: *See—*
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Ruble, Eulalia Berry, executrix: *See—*
Dollinger, Robert E.; Wright, Clinton M.; and Ruble, Theodore A., deceased, 4,106,912, Cl. 23-259.500.
Ruble, Theodore A., deceased: *See—*
Dollinger, Robert E.; Wright, Clinton M.; and Ruble, Theodore A., deceased, 4,106,912, Cl. 23-259.500.
Ruch, Jean, to Accumulatorenwerk Hoppecke Carl Zoellner & Sohn. Method and apparatus for the production of high outputs with high current densities in an electrochemical system. 4,107,396, Cl. 429-26.000.
Ruder, Joachim, to DeMag Aktiengesellschaft. Mixing bed pick up apparatus for a staple supply pile. 4,107,794, Cl. 366-346.000.
Rudolph, Siegfried; Noring, Josef; and Schreiber, August, to Schreiber-Klaranlagen Dr.-Ing. Aug. Schreiber GmbH & Co. KG. Drive device for rake arm with attached screen comb in cleaning device for a water conduit screen. 4,107,040, Cl. 210-159.000.
Ruegg, Rudolf: *See—*
Bollag, Werner; Ruegg, Rudolf; and Ryser, Gottlieb, 4,107,190, Cl. 260-404.000.
Ruf, Herbert; Deml, Dieter; and Schwarz, Werner, to Licentia Patent-Verwaltungs-G.m.b.H. Travelling-wave tube with collector housing having all electrical connections through one end wall of housing. 4,107,574, Cl. 315-3.500.
Ruffini, Guglielmo; and Pezzotti, Erio, to Consorzio Fabocart S.p.A. Preparation of paper pulps from dicotyledonous plants. 4,106,979, Cl. 162-73.000.
Rufolph, Hans: *See—*
Fuhr, Karl; Traenckner, Hans-Joachim; Rosenkranz, Hans Jurgen; Rufolph, Hans; Patheiger, Manfred; and Haus, Artur, 4,107,012, Cl. 204-159.190.
Ruhnau, Gerhard; Weise, Lutz; and Hesse, Karl-Heinz, to WABCO Westinghouse GmbH. Circuit arrangement for periodically testing the operating reliability of an electronic antiskid control system. 4,106,820, Cl. 303-92.000.
Ruhrchemie Aktiengesellschaft: *See—*
Giesen, Heinz; Hibbel, Josef; Jansen, Willi; and Speth, Sebastian, 4,107,036, Cl. 210-21.000.
Runge, Peter Klaus, to Bell Telephone Laboratories, Incorporated. Method of fabricating optical fiber connectors. 4,107,242, Cl. 264-1.000.
Rupprath, Hans Friedrich: *See—*
Schiron, Klaus; and Rupprath, Hans Friedrich, 4,106,134, Cl. 4-172.130.
Rusch, Thomas W.: *See—*
McKinney, James T.; and Rusch, Thomas W., 4,107,526, Cl. 250-305.000.
Rush, James B.: *See—*
Logan, Arthur D.; and Rush, James B., 4,106,967, Cl. 156-184.000.
Rusk, Glenn. Rotary energy converter with respiring chambers. 4,106,472, Cl. 123-205.000.
Russell, Charles E. Ice cream spoon. 4,106,197, Cl. 30-324.000.
Russell, Kenneth E.; and Vail, Linda G. M. C., to Canadian Patents and Development Limited. Phenolic antioxidants with polymer tails. 4,107,144, Cl. 526-212.000.
Russin, Morton S. Television color bar matching device. 4,106,846, Cl. 358-10.000.
Russo, Robert V.: *See—*
Keller, Alfred A.; Russo, Robert V.; and Treadwell, Kenneth, 4,107,069, Cl. 252-182.000.
Rutman, Grigory Iosifovich: *See—*
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barovich; Bazhakov, Daniel Kalimullovich; and Sivakov, Jury Mikhailovich, 4,107,090, Cl. 252-465.000.
Rutten, Peter T., to Railoc Company, Inc. Building structure. 4,106,252, Cl. 52-762.000.
Ruyak, Robert F., to Autoclave Engineers, Inc. High pressure magnetic drive including magnetic thrust bearings. 4,106,825, Cl. 308-139.000.
Rychlik, Dalibor: *See*—
Horacek, Oldrich; Silar, Frantisek; and Rychlik, Dalibor, 4,106,531, Cl. 139-383.00B.
Rymarchyk, Nicholas M.; and Meinert, Leo L., to Pullman Berry Company. Oxygen lance and sensing adapter arrangement. 4,106,756, Cl. 266-99.000.
Ryser, Gottlieb: *See*—
Bollag, Werner; Ruegg, Rudolf; and Ryser, Gottlieb, 4,107,190, Cl. 260-404.000.
S & C Electric Company: *See*—
Evans, David M., 4,107,486, Cl. 200-48.00R.
Evans, David M., 4,107,487, Cl. 200-48.0KB.
Saab-Scania Aktiebolag: *See*—
Sigfridsson, F.S. Meinrad; and Jansson, K. Sigvard, 4,106,538, Cl. 144-309.00R.
Saam, John C.; and Ward, Andrew H., to Dow Corning Corporation. Method for preparing improved polyalphamethyls tyrene-polydiorganosiloxane block copolymers and products thereof. 4,107,227, Cl. 260-827.000.
Sabatini, Charles L. Alarm system. 4,106,427, Cl. 116-90.000.
Sabins Industries, Inc.: *See*—
Sabins, Todd C., 4,107,017, Cl. 204-195.00R.
Sabins, Todd C., to Sabins Industries, Inc. Anode analyzer. 4,107,017, Cl. 204-195.00R.
Saburi, Akio, to Nippon Electric Co., Ltd. Method and apparatus for burst synchronization in a time division multiple access communication system. 4,107,608, Cl. 325-4.000.
Safety Jet: *See*—
Thon, Dieter, 4,106,787, Cl. 280-11.37E.
Sagami Chemical Research Center: *See*—
Tsuchihashi, Genichi; and Ogura, Katsuyuki, 4,107,178, Cl. 260-332.20A.
Sagapha A. G.: *See*—
Schmidgall, Heinz, 4,107,360, Cl. 427-389.000.
Saikku, Antti Tuomas, to Rauma-Repola Oy. Felling and cutting device. 4,106,537, Cl. 144-34.00R.
St. Peters, Richard L., to General Electric Company. Method for isotope-selective vibrational excitation of a gaseous compound of an isotope using multiple wavelengths. 4,107,536, Cl. 250-423.00P.
Saito, Hirokichi: *See*—
Takahashi, Akio; Saito, Hirokichi; and Oyaizu, Yoshijiro, 4,107,151, Cl. 528-54.000.
Saito, Hiroyasu: *See*—
Kameyama, Akinori; Matsunaga, Yoshiki; and Saito, Hiroyasu, 4,107,119, Cl. 260-29.4UA.
Saito, Takeo; and Seki, Youichi, to Seiko Koki Kabushiki Kaisha. Shutter control circuit having exposure time display. 4,107,708, Cl. 354-60.00L.
Saito, Takeshi: *See*—
Taniyasu, Ryozo; Kurokawa, Hideo; and Saito, Takeshi, 4,107,080, Cl. 252-431.00C.
Saito, Tamekazu; Tanaka, Mithunobu; Saito, Yutaka; and Sakaue, Kenich, to Showa Denko Kabushiki Kaisha. Process for preparing a ferrochromium by using a blast furnace. 4,106,929, Cl. 75-130.500.
Saito, Yutaka: *See*—
Saito, Tamekazu; Tanaka, Mithunobu; Saito, Yutaka; and Sakaue, Kenich, 4,106,929, Cl. 75-130.500.
Sakaba, Hiroo; and Masuda, Kenzo, to Hitachi, Ltd. Ratioless type MIS logic circuit. 4,107,548, Cl. 307-205.000.
Sakai, Akira; Inui, Taiji; and Yokoi, Yasuaki, to Hitachi, Ltd. Waste heat recovery boiler apparatus. 4,106,286, Cl. 60-39.18B.
Sakai, Jiro: *See*—
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Sakaue, Kenich: *See*—
Saito, Tamekazu; Tanaka, Mithunobu; Saito, Yutaka; and Sakaue, Kenich, 4,106,929, Cl. 75-130.500.
Sakurai, Shinichiro, to Nissan Motor Company, Limited. Motor vehicle body construction. 4,106,807, Cl. 296-28.00R.
Saleil, Jean: *See*—
Leroy, Pierre; Maubon, Andre; and Saleil, Jean, 4,106,758, Cl. 266-158.000.
Salje, Ernst; and Mushardt, Heinrich, to Salje, Ernst. Method of and apparatus for examining the roughness of surfaces. 4,106,333, Cl. 73-105.000.
Salje, Ernst; and Bartsch, Ulrich, to Salje, Ernst. Circular saw tool. 4,106,382, Cl. 83-835.000.
Sallis, Daniel V. Multiple bar linkage towing system. 4,106,794, Cl. 280-456.00R.
Salmon, Emigdio J., to Phillips Petroleum Company. Solvent removal from polymer solutions. 4,107,422, Cl. 528-502.000.
Salmond, William G.: *See*—
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Salter Labs., Inc.: *See*—
Salter, Peter W.; and Cook, William W., 4,106,505, Cl. 128-206.000.
Salter, Peter W.; and Cook, William W., to Salter Labs., Inc. Nasal cannula assembly. 4,106,505, Cl. 128-206.000.
Saluja, Satinder K., to American Sterilizer Company. Balanced single horizontal suspension arm. 4,107,769, Cl. 362-402.000.
Salvino, Santo. Prefabricated rail base unit consisting of a plurality of projections and a single continuous slab. 4,106,694, Cl. 238-10.00C.
Salzer, Erwin, to Gould Inc. Device for establishing electric contact pressure. 4,106,843, Cl. 339-232.000.
Sambucetti, Carlos Juan: *See*—
Kovac, Zlata; and Sambucetti, Carlos Juan, 4,107,063, Cl. 252-62.520.
Sanders Associates, Inc.: *See*—
Chicklis, Evan P.; Naiman, Charles S.; and Labaugh, Kenneth D., 4,107,529, Cl. 250-339.000.
Maben, James W., 4,107,737, Cl. 358-93.000.
Sanders, James Milton: *See*—
Sprecker, Mark A.; Vock, Manfred Hugo; Schmitt, Frederick Louis; Hall, John B.; and Sanders, James Milton, 4,107,093, Cl. 252-522.000.
Sandford, Philip A.: *See*—
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Sandoz, Inc.: *See*—
Houlihan, William J.; and Nadelson, Jeffrey, 4,107,311, Cl. 424-258.000.
Sandoz Ltd.: *See*—
Egger, Helmut; and Reinshagen, Hellmuth, 4,107,164, Cl. 544-380.000.
Hofer, Kurt; and Tscheulin, Guenther, 4,107,138, Cl. 260-45.70P.
Waldvogel, Erwin, 4,107,434, Cl. 544-59.000.
Sankyo Company Limited: *See*—
Ishibashi, Keijiro, 4,107,291, Cl. 424-48.000.
Nakamura, Toshiie; Shimizu, Hiromichi; Tanaka, Kyuichi; Kunitomo, Akihiko; and Tanizawa, Kinji, 4,107,300, Cl. 424-200.000.
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Sano, Shoichi, to Honda Giken Kogyo Kabushiki Kaisha. Structure of sealing air valves for split rim type wheels. 4,106,543, Cl. 152-405.000.
Sano, Takezo; Shimomura, Takatoshi; Sasaki, Masao; and Murase, Ichiki, to Sumitomo Chemical Company, Limited. Process for producing semipermeable membranes. 4,107,049, Cl. 210-490.000.
San Sebastian Saizar, Jose Maria. Safety apparatus for stopping an internal combustion engine in response to irregularities occur in the oil pressure or in the water temperature. 4,106,470, Cl. 123-198.0DB.
Santa Fe International Corporation: *See*—
Shatto, Harry H., 4,106,335, Cl. 73-143.000.
Santoro, Giovanni. Mechanical pushbutton devices suitable for recording positions of a mobile element in relation to a fixed support. 4,106,351, Cl. 74-10.330.
Saoyama, Yoshihito: *See*—
Nomaki, Koji; Saoyama, Yoshihito; and Tamamura, Ryo, 4,106,930, Cl. 75-134.00B.
Sarradin, Joel: *See*—
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Sartain, Everett L.: *See*—
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Sasaguri, Kyoji: *See*—
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Sasaki, Masao: *See*—
Sano, Takezo; Shimomura, Takatoshi; Sasaki, Masao; and Murase, Ichiki, 4,107,049, Cl. 210-490.000.
Sasaki, Yutaka; and Nakamura, Yoshimi, to Nitto Chemical Industry Co., Ltd. Process for production of attrition resistant antimony oxide containing fluidized bed catalyst having controlled particle size distribution. 4,107,085, Cl. 252-448.000.
Sasano, Akira: *See*—
Nakano, Toshio; Sasano, Akira; Tsutsui, Ken; and Matumaru, Haruo, 4,107,568, Cl. 313-371.000.
Sasayama, Atsushi: *See*—
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Sato, Iwao: *See*—
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Sato, Shigezi: *See*—
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Satoh, Hiroshi: *See*—
Fukuzuka, Toshio; Shimogori, Kazutoshi; and Satoh, Hiroshi, 4,107,024, Cl. 204-275.000.
Satoh, Masaaki: *See*—
Takahashi, Nobuaki; Nishikawa, Kazunori; Iwasaki, Yoshiki; Satoh, Masaaki; Ohba, Katsuhiro; Nakamura, Shinji; Sawada, Tatsuo; Ohsaki, Nobuhide; Itoh, Yasuo; Suda, Nobuaki; Okabe, Yasuhisa; and Ozaki, Hideaki, 4,107,478, Cl. 179-100.4ST.

Saucy, Gabriel: *See*—
Cohen, Noal; and Saucy, Gabriel, 4,107,183, Cl. 260-345.80R.
Sauers, Dale G.: *See*—
Dawn, Frederic S.; and Sauers, Dale G., 4,107,363, Cl. 428-109.000.
Saunders, James Fredrick, to Trane Company, The. Refrigerant charge adjuster apparatus. 4,106,306, Cl. 62-149.000.
Saunders, Raymond A., to United States of America, Navy. Ras-Gas dilution device. 4,106,910, Cl. 23-232.00R.
Saunders, Ronald A.; and Willard, Donald A. Simulation facility for dynamically testing guidance systems which use radiometric frequencies. 4,106,345, Cl. 73-432.0SD.
Savage, David Samuel: *See*—
Hewett, Colin Leslie; and Savage, David Samuel, 4,107,206, Cl. 260-562.00R.
Savage, Fred L.; and Long, Alfred D. Autonomic solar panel. 4,106,482, Cl. 126-271.000.
SAVIO e C. S.p.A.: *See*—
Savio, Ermanno; Calamani, Sergio; and Turri, Eugenio, 4,106,712, Cl. 242-47.010.
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Savvin, Mikhail Vasilievich: *See*—
Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pirogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Borisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; Shevtsov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich; Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mateshin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich; Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich; Koen, David Matveevich; Seleverstov, Vladimir Vasilievich; Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pizogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Bozisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zakharovich, 4,107,449, Cl. 13-35.000.
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Sawada, Tatsuo: *See*—
Takahashi, Nobuaki; Nishikawa, Kazunori; Iwasaki, Yoshiki; Satoh, Masaaki; Ohba, Katsuhiro; Nakamura, Shinji; Sawada, Tatsuo; Ohsaki, Nobuhide; Itoh, Yasuo; Suda, Nobuaki; Okabe, Yasuhisa; and Ozaki, Hideaki, 4,107,478, Cl. 179-100.4ST.
Sawai, Hideo; Hirabayashi, Satoshi; and Sato, Shigezi, to Dainippon Ink & Chemicals, Inc. Colored polyethylene molding compositions. 4,107,133, Cl. 260-42.150.
Scala, Norma, administratrix: *See*—
Burke, Oliver W., Jr., deceased; and Humphreys, Victor T., 4,107,126, Cl. 260-38.000.
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Burke, Oliver W., Jr., deceased; and Humphreys, Victor T., 4,107,132, Cl. 260-42.140.
Scales, John Tracy, to National Research Development Corporation. Endoprosthetic bone joint devices. 4,106,130, Cl. 3-1.910.
Scaletta, Ronald C., to Weinschel Engineering Co. Broadband microwave card attenuator. 4,107,633, Cl. 333-81.00A.
Scaletta, Ronald C.; and Capek, George, to Weinschel Engineering Co. Detent mechanism especially for microwave drum attenuator. 4,107,634, Cl. 333-81.00A.
Scamehorn, John F.; and Porchey, David V., to Continental Oil Company. Removal of vinyl halide from polyvinyl halide. 4,107,421, Cl. 528-483.000.
Schader, Karl, to Schneider & Kern. Dual readout dial-type caliper. 4,106,204, Cl. 33-147.00T.
Schank, Richard L.: *See*—
Conwell, Esther M.; Kermisch, Dorian; Maher, James C.; Pfister, Gustav R.; and Schank, Richard L., 4,106,848, Cl. 350-96.140.
Schaub, Robert Eugene: *See*—
Floyd, Middleton Brawner, Jr.; Weiss, Martin Joseph; McGahren, William James; and Schaub, Robert Eugene, 4,107,441, Cl. 560-121.000.
Schaub, Wolfgang: *See*—
Effland, Richard C.; Davis, Larry; and Schaub, Wolfgang, 4,107,074, Cl. 260-326.50B.
Effland, Richard C.; Davis, Larry; and Schaub, Wolfgang, 4,107,187, Cl. 260-326.290.
Schaumann, Wolfgang: *See*—
Kaiser, Fritz; Schaumann, Wolfgang; Stach, Kurt, deceased; Plattner, Werner, administrator; and Voightlander, Wolfgang, 4,107,299, Cl. 424-182.000.
Scheffer, Terry J.: *See*—
Doriguzzi, Rino; Egloff, Markus; Kaufmann, Meinolph; Nehring, Jurgen; and Scheffer, Terry J., 4,106,859, Cl. 350-338.000.
Scher, Victor H.; Fox, Theodore A.; and Sandford, Philip A., to Northern Electric Company. Apparatus for treating body members with heat and moisture. 4,107,509, Cl. 219-211.000.
Schering Corporation: *See*—
Mayer, Joseph; and Sherlock, Margaret H., 4,107,166, Cl. 260-294.80C.
Scheurecker, Werner, to Vereinigte Osterreichische Eisen-und Stahlwerke - Alpine Montan Aktiengesellschaft. Arrangement for transporting away strand pieces. 4,106,549, Cl. 164-263.000.
Schick, John W.; and Davis, Robert H., to Mobil Oil Corporation. Lubricant compositions containing biocidal, antirust additives. 4,107,060, Cl. 252-49.300.
Schickedanz, Willi. Facsimile color bleaching copying method. 4,107,733, Cl. 358-75.000.
Schier, Karl: *See*—
Deutschmann, Herbert; and Schier, Karl, 4,106,444, Cl. 123-41.82R.
Schilling, Hartmut, to Raytheon Company. Multilayer interconnected structure for semiconductor integrated circuit. 4,107,726, Cl. 357-71.000.
Schindler, Harvey D.: *See*—
Sze, Morgan C.; Riegel, Herbert; and Schindler, Harvey D., 4,107,222, Cl. 260-659.00A.
Schippers, Heinz; Lenk, Erich; Mayer, Manfred; Busch, Hans-Jochen; and Bremer, Hermann, to Barmag Barmer Maschinenfabrik Aktiengesellschaft. Winding machines with contact roller control device. 4,106,710, Cl. 242-18.00R.
Schiron, Klaus; and Rupprath, Hans Friedrich. Lifting floors for swimming pools. 4,106,134, Cl. 4-172.130.
Schirrmeister, Harry; von Aschwege, Gerd; Helmrich, Harald; and Bernardi, Herbert, to G.A.O. Gesellschaft fur Automation und Organisation mbH. Conveyor system for flat articles. 4,106,767, Cl. 271-188.000.
Schladitz, Hermann J. Electrical heating device. 4,106,891, Cl. 431-208.000.
Schlapbach, Louis: *See*—
Percheron born Guegen, Annick; Achard, Jean Claude; Loriers, Jean; Bonnemay, Maurice; Bronoel, Guy; Sarradin, Joel; and Schlapbach, Louis, 4,107,405, Cl. 429-218.000.
Schlichte, Max, to Siemens Aktiengesellschaft. Pulse code modulated, time division multiplex switching network. 4,107,480, Cl. 179-15.0AT.
Schlieckmann, Alfred, to Upjohn Company, The. Method for the continuous manufacture of foamed hollow profiles. 4,107,248, Cl. 264-51.000.
Schluenz, Robert William; and Davis, Curry Beach, to Arizona Chemical Company. Process for the preparation of terpene-maleic anhydride adducts. 4,107,420, Cl. 526-237.000.
Schlyakhin, Nikolai Pavlovich: *See*—
Moshnin, Evgeny Nikolaevich; Nistratov, Alexei Fedorovich; Odnodushny, Viktor Alexeevich; Romashko, Nikolai Ivanovich; and Schlyakhin, Nikolai Pavlovich, 4,106,322, Cl. 72-356.000.
Schmid, Alfred, to Bucher-Guyer AG Maschinenfabrik. Apparatus for separating liquids and solids from one another, especially for extracting juice from agricultural products. 4,106,404, Cl. 100-117.000.
Schmid, Hans F., to Mar-Kal Products Corporation. Vehicle sign holder. 4,106,229, Cl. 40-611.000.
Schmidgall, Heinz, to Sagapha A. G. Process for packing a pasty stain remover in portion capsules. 4,107,360, Cl. 427-389.000.
Schmidt, Arne Wintherhalter: *See*—
Markussen, Erik Kjaer; and Schmidt, Arne Wintherhalter, 4,106,991, Cl. 195-63.000.
Schmidt, Erich. Reinforced flexible conduit and method of manufacture. 4,106,527, Cl. 138-131.000.
Schmidt, Peter, to U.S. Philips Corporation. Clutch apparatus for generating a pulse train. 4,107,561, Cl. 310-95.000.
Schmidt, Robert H. Dryer attachment. 4,106,214, Cl. 34-86.000.
Schmitt, Frederick Louis: *See*—
Light, Kenneth K.; Vock, Manfred Hugo; Shuster, Edward J.; and Schmitt, Frederick Louis, 4,107,094, Cl. 252-522.000.
Sprecker, Mark A.; Vock, Manfred Hugo; Schmitt, Frederick Louis; Hall, John B.; and Sanders, James Milton, 4,107,093, Cl. 252-522.000.
Schmitt, Joseph J.; Dahlen, Richard R.; and Lindblad, David A., to Minnesota Mining and Manufacturing Company. Process for providing insulating covers. 4,106,905, Cl. 21-60.50R.
Schnabel Foundation Company: *See*—
Schnabel, Harry, Jr., 4,106,225, Cl. 37-184.000.
Schnabel, Harry, Jr., to Schnabel Foundation Company. Method and apparatus for excavating underpinning holes. 4,106,225, Cl. 37-184.000.
Schneider, Abraham; and Ware, Richard E., to Suntech, Inc. Process for improving the low temperature properties of tetrahydroalkyldicyclopentadienes. 4,107,223, Cl. 260-666.0PY.
Schneider, Abraham: *See*—
Myers, Harry K., Jr.; and Schneider, Abraham, 4,107,198, Cl. 260-464.000.
Schneider, Herbert Anton, to Bell Telephone Laboratories, Incorpo-

rated. Bipolar transistor switching network crosspoint. 4,107,474, Cl. 179-18.00GF.

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Schader, Karl, 4,106,204, Cl. 33-147.00T.

Schneider, Richard T. Rotating safety drum nuclear reactor. 4,106,984, Cl. 176-32.000.

Schneider, Urs; and Heller, Rudolf, to Synthes AG Chur; and Contraves AG. Plastic bone used for training purposes by surgeons. 4,106,219, Cl. 35-17.000.

Schoeneweis, E. Frederick, to Rockwell International Corporation. Method of assembling a coupling. 4,106,170, Cl. 29-157.10R.

Scholl Inc.: *See*—
Lowth, Leonard Cecil, 4,106,514, Cl. 128-519.000.

Scholz, Donald T., to Polaroid Corporation. Cassette receiving well structure for photographic viewing apparatus. 4,106,863, Cl. 352-72.000.

Schopmeyer, Herman H.: *See*—
Randall, James R.; Langhurst, Arling K.; Schopmeyer, Herman H.; and Seaton, Robert L., 4,106,487, Cl. 127-23.000.

Schrage, Klaus, to Dynamit Nobel Aktiengesellschaft. Method of preparing 2-aryl benzoxazoles and 2-aryl benzothiazoles. 4,107,169, Cl. 260-304.00P.

Schreck, Robert C.: *See*—
Heyn, Fred M.; Yin, Ching-Feng; Hanson, Gordon L.; and Schreck, Robert C., 4,106,556, Cl. 165-81.000.

Schreiber, August: *See*—
Rudolph, Siegfried; Noring, Josef; and Schreiber, August, 4,107,040, Cl. 210-159.000.

Schreiber-Klaranlagen Dr.-Ing. Aug. Schreiber GmbH & Co. KG: *See*—
Rudolph, Siegfried; Noring, Josef; and Schreiber, August, 4,107,040, Cl. 210-159.000.

Schreiber, William L.; Siano, James N.; and Shuster, Edward J., to International Flavors & Fragrances Inc. Substituted acetonaphthones, processes for preparing same, uses of same in perfumery, and intermediates used in said processes. 4,107,066, Cl. 252-132.000.

Schreiber, William L.; Siano, James N.; and Shuster, Edward J., to International Flavors & Fragrances Inc. Tetramethyl-hexahydroacetonaphthones. 4,107,208, Cl. 260-586.00F.

Schreiber, William L.; and Pittet, Alan O., to International Flavors & Fragrances Inc. Acetals of conjugated alkenals. 4,107,217, Cl. 260-615.00A.

Schrimper, Vernon L.: *See*—
Paterson, Malcolm M.; Grubbs, Michael R.; Cambourelis, Peter J.; and Schrimper, Vernon L., 4,107,034, Cl. 209-135.000.

Schrock, Wilfried; Konig, Hans-Bodo; Preiss, Michael; Metzger, Karl Georg; and Walkowiak, Michael, to Bayer Aktiengesellschaft. Oxoimidazolidine substituted cephalosporins and antibacterial compositions and methods of combatting bacteria employing them. 4,107,304, Cl. 424-246.000.

Schroeter, Siegfried H.: *See*—
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Schubert, Andreas: *See*—
Engelsmann, Dieter; Hackenberg, Hubert; and Schubert, Andreas, 4,107,703, Cl. 354-21.000.

Schucht, Peter, to Siemens Aktiengesellschaft. Pulse-modulated high-frequency transmitter. 4,107,630, Cl. 332-9.00T.

Schuder, Paul S. Mattress construction. 4,106,142, Cl. 5-345.00R.

Schuette, William H.; and Norris, George F., to United States of America, Health, Education and Welfare. Real time two-dimensional mechanical ultrasonic sector scanner with electronic control of sector width. 4,106,492, Cl. 128-2.00V.

Schuler, Alan L.; and Post, David L., to General Dynamics Corporation. Insulated marine container for liquefied gas. 4,106,424, Cl. 114-74.00A.

Schuller, Hans: *See*—
Szabolcs, Otto; and Schuller, Hans, 4,107,409, Cl. 526-65.000.

Schultz, Jean-Pierre; Cuny, Francis; Payraudeau, Daniel; and Tritz, Jean-Marie, to L'Air Liquide Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Arc welding process and apparatus. 4,107,507, Cl. 219-121.00P.

Schultz, Otto; and Feutlinske, Hilmar, to Hamburger Hochbahn Aktiengesellschaft. Locking mechanism arrangement for a hinged bus. 4,106,792, Cl. 280-432.000.

Schultz, Robert S. Pressure-operated container for viscous products. 4,106,674, Cl. 222-386.500.

Schulz, Hansrichard; and Hummel, Herbert. Method and apparatus for synchronizing a mechanical oscillating system to the accuracy of a quartz standard. 4,106,280, Cl. 58-28.00R.

Schulz, Lothar; and Arpe, Hans-Jurgen, to Hoechst Aktiengesellschaft. Process for the preparation of bromine and hydrogen bromide from ammonium bromide. 4,107,263, Cl. 423-481.000.

Schuster, Robert M.; and Luria, Norman G., to General Electric Company. Electrical penetration assembly. 4,107,456, Cl. 174-151.000.

Schwarz, Werner: *See*—
Ruf, Herbert; Deml, Dieter; and Schwarz, Werner, 4,107,574, Cl. 315-3.500.

Schwarzbauer, Hans: *See*—
Eck, Herbert; Bethe, Elmar; Schwarzbauer, Hans; Spes, Hellmuth; and Kaiser, Klaus, 4,107,002, Cl. 203-75.000.

Schwetz, Karl Alex; Vogt, George; and Lipp, Alfred, to Elektroschmelzwerk Kempten GmbH. Manufacture of hexagonal boron nitride. 4,107,276, Cl. 423-290.000.

SCM Corporation: *See*—
McGinniss, Vincent Daniel; Seidewand, Robert Joseph; and Erickson, James Robert, 4,107,013, Cl. 204-159.160.
Petricca, Anthony V., 4,107,343, Cl. 426-564.000.

Scott, Allan W.: *See*—
Potter, Bobby R.; and Scott, Allan W., 4,107,573, Cl. 315-3.500.

Scott, Timothy Frank: *See*—
Petersen, Oscar Johan; and Scott, Timothy Frank, 4,106,995, Cl. 195-103.50R.

Scott, William B.: *See*—
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Scrivo, Jerry V., to McCord Corporation. Energy absorbing bumper assembly. 4,106,804, Cl. 293-63.000.

Scullard, Peter W.; Figueras, John; and Holtz, Carl F., to Eastman Kodak Company. Photographic silver halide elements containing optical brightening water-soluble interpolymers. 4,106,941, Cl. 96-82.000.

Seaton, Robert L.: *See*—
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Segawa, Takashi, to Shimano Industrial Company Limited. Multistage gear crank for a bicycle. 4,106,357, Cl. 74-243.0DR.

Seguin, Gerard Newsy. Golf game board assembly. 4,106,774, Cl. 273-245.000.

Seidewand, Robert Joseph: *See*—
McGinniss, Vincent Daniel; Seidewand, Robert Joseph; and Erickson, James Robert, 4,107,013, Cl. 204-159.160.

Seifert, Peter; and Zimmerman, Walter R., to Black Clawson Company, The. Thickener apparatus including a shaftless cylinder mold. 4,106,980, Cl. 162-330.000.

Seiko Koki Kabushiki Kaisha: *See*—
Saito, Takeo; and Seki, Youichi, 4,107,708, Cl. 354-60.00L.

Seiler, Hartmut, to Robert Bosch GmbH. Multiple timing interval integrated circuit structure. 4,107,588, Cl. 318-484.000.

Seiling, Samuel O., to AMF Incorporated. Method with an improved mixing cycle for preparing dough. 4,107,341, Cl. 426-504.000.

Seipp, William H., to Gulf & Western Industries, Inc. Programmable controller using microprocessor. 4,107,785, Cl. 364-900.000.

Seita, Toru; Asami, Shunichi; and Shimizu, Akihiko, to Toyo Soda Manufacturing Co., Ltd. Process for preparing polycation-polyanion electrolyte complexes having carboxylic acid and alkenyl radical substituents and films thereof. 4,107,097, Cl. 521-32.000.

Sekhon, Kalwant S.; Nelson, Lloyd A.; and Fritz, John E., Jr., to Hughes Aircraft Company. Transistor cooling by heat pipes. 4,106,188, Cl. 29-631.000.

Seki, Youichi: *See*—
Saito, Takeo; and Seki, Youichi, 4,107,708, Cl. 354-60.00L.

Sekisui Kagaku Kogyo Kabushiki Kaisha: *See*—
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Selenia-Industrie Elettroniche Associate S.p.A.: *See*—
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Seletyn, James P. Threaded stud driving tool. 4,106,178, Cl. 29-428.000.

Seleverstov, Vladimir Vasilievich: *See*—
Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pirogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Borisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; Shevtsov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich; Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mateshin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich; Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich; Koen, David Matveevich; Seleverstov, Vladimir Vasilievich; Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pizogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Bozisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zakharovich, 4,107,449, Cl. 13-35.000.

Sellers, John C.; and Romanauski, James A. Transponder-responder system. 4,107,675, Cl. 343-6.5LC.

Selley, Jeffrey E.: *See*—
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Selon, Michael David. Two-dimensional visualization aid for the retail jewelry trade. 4,106,221, Cl. 35-53.000.

Sensotherm AB: *See*—
Almen, Rune, 4,107,394, Cl. 428-595.000.

Serban, Alexandru: *See*—
Baklien, Asbjorn; Serban, Alexandru; and Gregory, Jocelyn Margaret, 4,106,924, Cl. 71-106.000.

Serrano, Juan de J., to General Electric Company. Linearized thermistor temperature measuring circuit. 4,106,341, Cl. 73-362.0AR.

Seydl, Wolfgang: *See*—
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Shack, Carl J.: *See*—
Christe, Karl O.; Shack, Carl J.; and Wilson, Richard D., 4,107,275, Cl. 423-276.000.

Shalimova, Zoya Stepanovna: *See*—
Fasman, Anatoly Borisovich; Sokolsky, Dmitry Vladimirovich; Rutman, Grigory Iosifovich; Michurov, Jury Ivanovich; Zavorin, Viktor Anatolievich; Shalimova, Zoya Stepanovna;

Timofeeva, Venera Fatykhovna; Dautov, Tulkibai Galikbarovich; Bazhakov, Daniel Kalimullovich; and Sivakov, Jury Mikhailovich, 4,107,090, Cl. 252-465.000.

Sharples, Thomas Davy, to Beckman Instruments, Inc. Liquid head control system. 4,106,671, Cl. 222-61.000.

Shatto, Harry H., to Santa Fe International Corporation. Sea sled tow line vector system. 4,106,335, Cl. 73-143.000.

Shea, Lawrence E. Fire-resistant synthetic resin composition and method. 4,107,127, Cl. 260-38.000.

Sheffner, Aaron Leonard. Topical application of thioglycolic acid in the treatment of acne. 4,107,330, Cl. 424-317.000.

Shell Internationale Research Maatschappij B.V.: *See*—
Van Riemsdijk, Arnoldus J.; and Hendal, Willem P., 4,107,672, Cl. 340-605.000.

Shell Oil Company: *See*—
Gergen, William P.; and Davison, Sol, 4,107,130, Cl. 260-40.00R.
Gergen, William P.; and Davison, Sol, 4,107,131, Cl. 260-40.0TN.
Hansen, David R., 4,107,233, Cl. 260-876.00B.
Himes, Glenn R., 4,107,124, Cl. 260-33.6AQ.
Huizer, Willem, 4,106,585, Cl. 181-107.000.

Shepherd, Bryan Peter: *See*—
Charlton, John Cecil; Glover, John Stuart; and Shepherd, Bryan Peter, 4,106,907, Cl. 23-230.300.

Shepherd, Thomas L., to Airco, Inc. Sulfur-fueled magnetohydrodynamic power generation. 4,107,557, Cl. 310-11.000.

Shepler, Paul Roberts: *See*—
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Sherlock, Margaret H.: *See*—
Mayer, Joseph; and Sherlock, Margaret H., 4,107,166, Cl. 260-294.80C.

Sherrod, Eugene L. Positive displacement pump for semi-fluid materials. 4,106,882, Cl. 417-517.000.

Sherwood Medical Industries Inc.: *See*—
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Shevtsov, Anatoly Zakharovich: *See*—
Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pirogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Borisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; Shevtsov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich; Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mateshin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich; Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich; Koen, David Matveevich; Seleverstov, Vladimir Vasilievich; Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pizogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Bozisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zakharovich, 4,107,449, Cl. 13-35.000.
Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pirogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Borisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; Shevtsov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich; Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mateshin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich; Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich; Koen, David Matveevich; Seleverstov, Vladimir Vasilievich; Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pizogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Bozisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zakharovich, 4,107,449, Cl. 13-35.000.

Shima, Tsukasa: *See*—
Kusunose, Tetsuhiro; Shima, Tsukasa; Henmi, Hiroshi; and Yasui, Sadahiko, 4,107,374, Cl. 428-288.000.

Shimada, Hiroyuki; and Toyoda, Shozo, to Mitsubishi Jukogyo Kabushiki Kaisha. Marine oil storage installation. 4,106,303, Cl. 61-101.000.

Shimada, Satoshi; and Itoh, Norio, to Sony Corporation. Image projection system. 4,106,866, Cl. 353-29.000.

Shimano Industrial Company Limited: *See*—
Nagano, Masashi; and Fujimoto, Hideaki, 4,106,356, Cl. 74-217.00B.
Segawa, Takashi, 4,106,357, Cl. 74-243.0DR.

Shimizu, Akihiko: *See*—
Seita, Toru; Asami, Shunichi; and Shimizu, Akihiko, 4,107,097, Cl. 521-32.000.

Shimizu, Hiromichi: *See*—
Nakamura, Toshiie; Shimizu, Hiromichi; Tanaka, Kyuichi; Kunitomo, Akihiko; and Tanizawa, Kinji, 4,107,300, Cl. 424-200.000.

Shimoda, Misao, to Olympus Optical Co., Ltd. Magnetic head. 4,107,751, Cl. 360-122.000.

Shimogori, Kazutoshi: *See*—
Fukuzuka, Toshio; Shimogori, Kazutoshi; and Satoh, Hiroshi, 4,107,024, Cl. 204-275.000.

Shimomura, Takatoshi: *See*—
Sano, Takezo; Shimomura, Takatoshi; Sasaki, Masao; and Murase, Ichiki, 4,107,049, Cl. 210-490.000.

Shinkado, Yukio: *See*—
Ban, Itsuki; Nozaki, Sumio; Kasuya, Takanori; Shinkado, Yukio; and Yano, Kanji, 4,107,750, Cl. 360-106.000.

Shinoda, Kazuo; and Torii, Masanori, to Toyota Jidosha Kogyo Kabushiki Kaisha. Fuel supply installation for internal combustion engines. 4,106,456, Cl. 123-119.00E.

Shinoda, Naoharu: *See*—
Atsukawa, Masumi; Shinoda, Naoharu; and Tanaka, Takeji, 4,107,271, Cl. 423-235.000.

Shipman, William H.: *See*—
Goodson, Forrest R.; Shipman, William H.; and McCartney, Joseph F., 4,107,401, Cl. 429-101.000.

Shirai, Tadashi: *See*—
Tashiro, Yasuhisa; Sugimura, Hideo; Arai, Toshiaki; Suzuki, Masao; and Shirai, Tadashi, 4,107,203, Cl. 260-518.00R.

Shiraki, Manabu: *See*—
Ban, Itsuki; and Shiraki, Manabu, 4,107,587, Cl. 318-439.000.

Shirn, George A.; Linzey, Raynor; and Cushenette, Carol A., to Sprague Electric Company. Fused oil filled capacitor. 4,107,758, Cl. 361-275.000.

Shirn, George A.; and Maher, John P., to Sprague Electric Company. Fused monolithic ceramic capacitor package. 4,107,759, Cl. 361-275.000.

Shirn, George A.; and Maher, John P., to Sprague Electric Company. Solid electrolyte capacitor package with an exothermically-alloyable fuse. 4,107,762, Cl. 361-433.000.

Shirogami, Tamotsu: *See*—
Takamura, Tsutomu; and Shirogami, Tamotsu, 4,107,403, Cl. 429-174.000.

Shishiyannikov, Viktor Iosifovich: *See*—
Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pirogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Borisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; Shevtsov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich; Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mateshin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich; Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich; Koen, David Matveevich; Seleverstov, Vladimir Vasilievich; Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pizogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Bozisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zakharovich, 4,107,449, Cl. 13-35.000.

Shook, Robert L.; and Sirak, Howard D., to Executive Products Corporation. Executive food carrying case. 4,106,597, Cl. 190-42.000.

Showa Denko K. K.: *See*—
Kagawa, Fumio; and Aoki, Norimichi, 4,106,915, Cl. 51-296.000.

Showa Denko Kabushiki Kaisha: *See*—
Saito, Tamekazu; Tanaka, Mithunobu; Saito, Yutaka; and Sakaue, Kenich, 4,106,929, Cl. 75-130.500.

Showa Sangyo Co. Ltd.: *See*—
Kanno, Tomoei; Watanabe, Hiroaki; and Sano, Shohachiro, 4,106,987, Cl. 195-31.00F.

Shrimpton, Brian Clifford, to General Foods Limited. Soluble coffee process and product. 4,107,339, Cl. 426-387.000.

Shroot, Braham: *See*—
Cox, David A.; Gymer, Geoffrey E.; and Shroot, Braham, 4,107,314, Cl. 424-263.000.

Shull, Charles S.: *See*—
Morgan, Albert W.; Shull, Charles S.; and Vanderlinde, William, 4,107,122, Cl. 260-30.200.

Shulz, Robert J.; and Kozinczuk, Orest A., to Innovative Patent Trust. Control system for an electrolytic steam generator. 4,107,511, Cl. 219-286.000.

Shuster, Edward J.: *See*—
Light, Kenneth K.; Vock, Manfred Hugo; Shuster, Edward J.; and Schmitt, Frederick Louis, 4,107,094, Cl. 252-522.000.
Schreiber, William L.; Siano, James N.; and Shuster, Edward J., 4,107,066, Cl. 252-132.000.
Schreiber, William L.; Siano, James N.; and Shuster, Edward J., 4,107,208, Cl. 260-586.00F.

Shwert, Marianne J.: *See*—
Glickstein, Myer; Tuomy, Justin M.; and Shwert, Marianne J., 4,107,335, Cl. 426-96.000.

Siano, James N.: *See*—
Schreiber, William L.; Siano, James N.; and Shuster, Edward J., 4,107,066, Cl. 252-132.000.
Schreiber, William L.; Siano, James N.; and Shuster, Edward J., 4,107,208, Cl. 260-586.00F.

Sickles, James E.; Hornyak, Joseph V.; and Franz, Helmut, to PPG Industries, Inc. Spraying device with gas shroud and electrostatic charging means having a porous electrode. 4,106,697, Cl. 239-15.000.

Sid Richardson Carbon & Gasoline Co.: *See*—
Dollinger, Robert E.; Wright, Clinton M.; and Ruble, Theodore A., deceased, 4,106,912, Cl. 23-259.500.

Siebert, Alan R.: *See*—
Riew, Changkiu Keith; Siebert, Alan R.; and Rowe, Eugene H., 4,107,116, Cl. 260-23.0EP.

Siefken, Larry O. Device for puncturing a hole in a can and washing the inside thereof. 4,106,701, Cl. 239-271.000.

Siemens Aktiengesellschaft: *See*—
Distler, Georg; and Guetzl, Horst, 4,107,500, Cl. 200-308.000.

Graul, Juergen; and Murrmann, Helmut, 4,107,719, Cl. 357-15.000.
Schlichte, Max, 4,107,480, Cl. 179-15.0AT.
Schucht, Peter, 4,107,630, Cl. 332-9.00T.
Stut, Hans, 4,107,448, Cl. 13-26.000.
Trentini, Giswalt V.; and Jatsch, Werner, 4,107,690, Cl. 343-113.00R.
Wondra, Arthur, 4,107,696, Cl. 346-24.000.

Siems, Gerald Eugene, to J. I. Case Company. Rod oiler assembly. 4,106,592, Cl. 184-25.000.

Sigfridsson, F.S. Meinrad; and Jansson, K. Sigvard, to Saab-Scania Aktiebolag. Translatory feed of lumber workpieces from an orienting station through an edge trimming station. 4,106,538, Cl. 144-309.00R.

SIGMA-TAU Industrie Farmaceutiche Riunite S.p.A.: *See*—
Diamanti, Enrico, 4,107,316, Cl. 424-266.000.

Sikma, William J.; and Pease, Ronald J. Garden row marker. 4,106,203, Cl. 33-86.000.

Silantiev, Ivan Kuzmich: *See*—
Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pirogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Borisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; Shevtsov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich; Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mateshin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich; Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich; Koen, David Matveevich; Seleverstov, Vladimir Vasilievich; Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pizogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Bozisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zakharovich, 4,107,449, Cl. 13-35.000.

Silar, Frantisek: *See*—
Horacek, Oldrich; Silar, Frantisek; and Rychlik, Dalibor, 4,106,531, Cl. 139-383.00B.

Silverman, Daniel. Method and apparatus for transferring a pattern on an overlying web by laser burning onto an underlying web. 4,107,528, Cl. 250-317.000.

Simmons Company: *See*—
Murphy, Timothy P., 4,106,138, Cl. 5-181.000.

Simon, Eli. Salts of benzenephosphonic acid and melamine as reactive additives to flammable epoxy monomers to reduce flammability of the cured reaction products. 4,107,145, Cl. 528-108.000.

Simonnet, Jacques Louis-Paul: *See*—
Bobleter, Andre Henri-Robert; and Simonnet, Jacques Louis-Paul, 4,106,894, Cl. 432-122.000.

Simpson Manufacturing Co., Inc.: *See*—
Gilb, Tyrell T., 4,106,257, Cl. 52-693.000.

Simpson, William A., Jr.: *See*—
Adler, Laszlo; Von Cook, K.; Simpson, William A., Jr.; and Lewis, D. Kent, 4,106,327, Cl. 73-1.0DV.

Singer Company, The: *See*—
Clowers, Earl R.; and Davis, John C., 4,106,165, Cl. 24-134.00R.
Herr, John A.; and Jaffe, Wolfgang, 4,107,591, Cl. 318-663.000.
Miller, Jerome Freed, 4,106,308, Cl. 62-324.000.
Weaver, Daniel J.; Treiber, Robert; and Wolanow, Avner, 4,107,596, Cl. 323-17.000.

Single Buoy Moorings Inc.: *See*—
Maari, Roger, 4,106,146, Cl. 9-8.00P.

Singleton, Max C.; and Elgart, Lea Frances, to Elgart, Lea Frances. Self-illuminating hand tool. 4,107,765, Cl. 362-120.000.

Sirak, Howard D.: *See*—
Shook, Robert L.; and Sirak, Howard D., 4,106,597, Cl. 190-42.000.

Sisson, James Bryant, to Procter & Gamble Company, The. Random laid bonded continuous filament cloth. 4,107,364, Cl. 428-196.000.

Sivakov, Jury Mikhailovich: *See*—
Fasman, Anatoly Borisovich; Sokolsky, Dmitry Vladimirovich; Rutman, Grigory Iosifovich; Michurov, Jury Ivanovich; Zavorin, Viktor Anatolievich; Shalimova, Zoya Stepanovna; Timofeeva, Venera Fatykhovna; Dautov, Tulkibai Galikbarovich; Bazhakov, Daniel Kalimullovich; and Sivakov, Jury Mikhailovich, 4,107,090, Cl. 252-465.000.

Sjalander, Theodor. Method of forming a wrapping for a shipment unit and device for carrying out the method. 4,106,394, Cl. 93-1.00F.

Skaggs, Frank L.: *See*—
Adcock, Willis A.; and Skaggs, Frank L., 4,107,732, Cl. 358-43.000.

SKF Industrial Trading and Development Company B.V.: *See*—
Hallerback, Stig Lennart, 4,107,560, Cl. 310-60.00R.

Sletzinger, Meyer: *See*—
Christensen, Burton G.; Cama, Lovji D.; Karady, Sandor; and Sletzinger, Meyer, 4,107,432, Cl. 544-21.000.

Sloan Valve Company: *See*—
Horowitz, Charles, 4,106,834, Cl. 339-44.00M.

Slough, Carlton M., to Texaco Inc. Electromagnetic means and method for detecting propeller shaft bearing wear. 4,107,603, Cl. 324-207.000.

Slovinsky, Manuel; and Fong, Dodd Wing, to Nalco Chemical Company. Antifoulants for crude oil. 4,107,030, Cl. 208-48.0AA.

Smirnov, Jury Alexandrovich: *See*—
Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pirogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Borisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; Shevtsov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich; Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mateshin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich; Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich; Koen, David Matveevich; Seleverstov, Vladimir Vasilievich; Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pizogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Bozisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zakharovich, 4,107,449, Cl. 13-35.000.

Smith, Brian Roger; Jarvis, Charles Richard; Payne, Stephen Martin; Potts, Robert John; and Wallis, Frank, to Marconi Company Limited, The. Curved rigid printed circuit boards. 4,106,187, Cl. 29-625.000.

Smith, Dexter E.: *See*—
Tuckett, William F.; Funk, Gary L.; and Smith, Dexter E., 4,106,916, Cl. 55-21.000.

Smith, Dexter William: *See*—
Tombs, Terence Leslie; Miles, Brian Leslie; and Smith, Dexter William, 4,107,510, Cl. 219-270.000.

Smith, Frank A.: *See*—
Augustine, Harry G.; Krupinski, Kenneth C.; and Smith, Frank A., 4,107,382, Cl. 428-368.000.

Smith, Geoffrey Allan; and Laidlaw, Alan James, to Fastran AG. Dye transferring method. 4,106,895, Cl. 8-2.50A.

Smith, Herman W., to Upjohn Company, The. 13,14-Didehydro-PGF, compounds. 4,107,191, Cl. 260-408.000.

Smith Kline & French Laboratories Limited: *See*—
Durant, Graham John; Ganellin, Charon Robin; and Young, Rodney Christopher, 4,107,319, Cl. 424-273.00R.

Smith, Robert W., Jr.; and Waite, George C., to Trech, Inc. Reinforced splice joint and method of making same. 4,107,451, Cl. 174-84.00R.

Smith, Walton J. Horticultural improvements. 4,106,235, Cl. 47-59.000.

SmithKline Corporation: *See*—
Berges, David A., 4,107,173, Cl. 260-308.00R.
Gleason, John Gerald, 4,107,440, Cl. 560-17.000.
Graboyes, Harold, 4,107,179, Cl. 260-332.20A.

Smithline, John P., to Pacific Handy Cutter, Inc. Coin wrapper cutting device. 4,106,196, Cl. 30-294.000.

Smykalla, Gunter: *See*—
von Ropenack, Adolf; Wiegand, Volker; and Smykalla, Gunter, 4,107,265, Cl. 423-101.000.

Snamprogetti, S.p.A.: *See*—
Priola, Aldo; Cesca, Sebastiano; and Ferraris, Giuseppe, 4,107,417, Cl. 526-117.000.

Snitzer, Elias, to Better Environmental Development Corporation. Optical filters. 4,106,857, Cl. 350-311.000.

Snyder, Arthur R.: *See*—
Fields, Marvin C.; Oliver, David L.; and Snyder, Arthur R., 4,106,917, Cl. 55-31.000.

Sobotta, Reinhard, to Rollei-Werke Franke & Heidecke. Slide projector for both magazine and single slide projection. 4,106,867, Cl. 353-114.000.

Societa Farmaceutici Italia S.p.A.: *See*—
Arcamone, Federico; Bernardi, Luigi; Patelli, Bianca; and Penco, Sergio, 4,107,423, Cl. 536-4.000.

S.A. dite "Manufacture Francaise de Carrelages": *See*—
Bourguignon, Guy Clement; and Maquet, Joseph Andre, 4,107,378, Cl. 428-323.000.

Societe Anonyme Francaise du Ferodo: *See*—
Neveux, Rene Elie, 4,106,558, Cl. 165-109.000.

Societe Anonyme Parfumerie et Chimieparchimy: *See*—
Leclabart, Jacques, 4,106,652, Cl. 215-253.000.

Societe de Constructions Mecaniques de Creil-COMEC: *See*—
Robert, Daniel, 4,106,647, Cl. 214-152.000.

Societe de vente de l'Aluminium Pechiney: *See*—
Bercovici, Serge, 4,106,956, Cl. 148-11.50A.

Societe d'Etudes de Machines Thermiques-S.E.M.T.: *See*—
Haug, Albert, 4,106,798, Cl. 285-226.000.

Societe dite: Stabilimento Industriale Costruzione Macchinario Attrezzature: *See*—
Bossi, Oscar G., 4,106,632, Cl. 214-1.0BB.

Societe Europeenne des Produits Refractaires: *See*—
Recasens, Joseph; and Penez, Andre, 4,106,947, Cl. 106-57.000.

Societe Francaise d'Organo Synthese: *See*—
Proux, Yves; and Julien, Christian, 4,107,137, Cl. 260-45.85T.

Societe Francaise pour le Developpement de l'Automatisme en Biologie: *See*—
Marcelli, Aline, 4,106,911, Cl. 23-259.000.

Societe Nouvelle de Bouchons Plastiques, S.N.B.P.: *See*—
Babiol, Pierre, 4,106,656, Cl. 215-364.000.

Soderstrom, Sven-Erik, to ASEA Aktiebolag. Cloud altitude measuring apparatus and method. 4,106,872, Cl. 356-4.000.

Sokolow, Nickolas N., to Beloit Corporation. Parison pickers with variable spacing. 4,106,886, Cl. 425-526.000.

Sokolsky, Dmitry Vladimirovich: *See*—
Fasman, Anatoly Borisovich; Sokolsky, Dmitry Vladimirovich; Rutman, Grigory Iosifovich; Michurov, Jury Ivanovich; Zavorin, Viktor Anatolievich; Shalimova, Zoya Stepanovna; Timofeeva, Venera Fatykhovna; Dautov, Tulkibai Galikbarovich; Bazhakov, Daniel Kalimullovich; and Sivakov, Jury Mikhailovich, 4,107,090, Cl. 252-465.000.

Solomin, Georgy Stepanovich: *See*—
Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pirogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Borisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigo-

riev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; Shevtsov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich; Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mateshin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich; Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich; Koen, David Matveevich; Seleverstov, Vladimir Vasilievich; Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pizogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Bozisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zakharovich, 4,107,449, Cl. 13-35.000.

Solvay & Cie.: *See—*
Mulders, Julien; and Gilain, Jacques, 4,107,411, Cl. 526-75.000.

Somerville Belkin Industries Limited: *See—*
Claxton, Joseph Edmund, 4,107,399, Cl. 429-89.000.

Sommer, Walter: *See—*
Witt, Karl-Heinz; and Sommer, Walter, 4,107,359, Cl. 427-388.00R.

Sone, Takanori: *See—*
Suzuki, Nobuyuki; Kobayashi, Yukinari; Hiyoshi, Yumiko; Takagi, Seiji; Sone, Takanori; Wakabayashi, Mikio; and Sowa, Tuneo, 4,107,162, Cl. 544-313.000.

Sono, Junji: *See—*
Fujiyoshi, Kanji; Fukuda, Minoru; Mizumura, Yutaka; Sono, Junji; and Naito, Iori, 4,107,148, Cl. 528-273.000.

Sonobe, Hisao; Okada, Sadayuki; Oe, Etsuo; Tsukioka, Hideo; and Sato, Moriichi, to Hitachi, Ltd. Open-type boiling cooling apparatus. 4,106,557, Cl. 165-105.000.

Sony Corporation: *See—*
Higuchi, Shigetaka; Iwasaki, Masaatsu; and Kimura, Shigeo, 4,107,385, Cl. 428-412.000.
Kumaki, Noboru, 4,107,747, Cl. 360-93.000.
Nishigaki, Susumu; and Ohgoshi, Akio, 4,107,657, Cl. 340-579.000.
Otobe, Takashi; Kojima, Chiaki; and Ohki, Hiroshi, 4,107,729, Cl. 358-4.000.
Shimada, Satoshi; and Itoh, Norio, 4,106,866, Cl. 353-29.000.
Takizawa, Kazuyuki, 4,106,775, Cl. 274-15.00R.

Sorenson, James L., to Sorenson Research Co., Inc. Combination needle cover and venipuncture device tray and method of using same. 4,106,621, Cl. 206-365.000.

Sorenson Research Co., Inc.: *See—*
Sorenson, James L., 4,106,621, Cl. 206-365.000.

Sorg GmbH & Co. KG: *See—*
Pieper, Helmut, 4,107,446, Cl. 13-6.000.
Pieper, Helmut, 4,107,447, Cl. 13-6.000.

Sorgatz, Robert G. Rotatable support stand. 4,106,830, Cl. 339-8.00R.

Sormunen, Onni Sore. Pressure measuring apparatus. 4,106,342, Cl. 73-386.000.

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Linne, Robert Steven, 4,106,319, Cl. 72-234.000.

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Brown, Geoffrey Edward, 4,107,558, Cl. 310-13.000.

Spector, Sidney, to Hoffmann-La Roche Inc. Barbituric acid antigens and antibodies specific therefor. 4,107,157, Cl. 260-112.00B.

Speiser, Peter: *See—*
Oppenheim, Richard Charles; Marty, Jennifer Joy; and Speiser, Peter, 4,107,288, Cl. 424-22.000.

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Sperry Rand Corporation: *See—*
Griffith, Carl D., 4,106,728, Cl. 244-83.00D.
McMahon, Donald H., 4,107,518, Cl. 250-199.000.
Turner, Paul F., 4,107,624, Cl. 331-8.000.

Spes, Hellmuth: *See—*
Eck, Herbert; Bethe, Elmar; Schwarzbauer, Hans; Spes, Hellmuth; and Kaiser, Klaus, 4,107,002, Cl. 203-75.000.

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Giesen, Heinz; Hibbel, Josef; Jansen, Willi; and Speth, Sebastian, 4,107,036, Cl. 210-21.000.

Spilman, Raymond; Haase, Edward Emil, Jr.; Kruger, Kurt John; Budnick, Donald Barry; and Lasorso, Vincent John, Jr., to Spilman, Raymond; Haase, Edward Emil, Jr.; Kruger, Kurt John; Budnick, Donald Barry; Lasorso, Vincent John, Jr.; and Reens, Louis H. Urine collection aid. 4,106,490, Cl. 128-2.00F.

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Sports Technology Inc.: *See—*
Krawagna, Alois, 4,106,772, Cl. 273-186.00R.

Sprague Electric Company: *See—*
Fournier, Lawrence E.; Jasiewicz, Theodore M.; and Milton, William M., 4,106,184, Cl. 29-570.000.
Shirn, George A.; Linzey, Raynor; and Cushenette, Carol A., 4,107,758, Cl. 361-275.000.
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Sprague, Robert A.; and MacGovern, Alan J., to Itek Corporation. Acousto-optic snapshot recorder. 4,107,701, Cl. 346-108.000.

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Stach, Kurt, deceased: *See—*
Kaiser, Fritz; Schaumann, Wolfgang; Stach, Kurt, deceased; Plattner, Werner, administrator; and Voightlander, Wolfgang, 4,107,299, Cl. 424-182.000.

Stack, Gary F.: *See—*
Dent, Richard G.; and Stack, Gary F., 4,106,659, Cl. 220-67.000.

Stafford, Jay H., to Continental Oil Company. Hydraulic vibrator. 4,106,586, Cl. 181-121.000.

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Li, George S., 4,107,237, Cl. 260-880.00R.

Standard Oil Company (Indiana): *See—*
Hughes, Robert D.; and Steigelmann, Edward F., 4,106,920, Cl. 55-158.000.
Zechinati, James; and Pegg, Elra W., 4,107,250, Cl. 264-118.000.

Standard T. Chemical Company, Inc.: *See—*
Brower, Loyd R., Jr.; Madsen, Leonard P.; Zutaut, Chesly L.; and Barden, Walter M., Jr., 4,107,016, Cl. 204-181.00R.

Stannow, Jorgen Christian; and Tankred, Hans Jurgen, to Danfoss A/S. Encapsulated motor compressor for refrigerators. 4,106,881, Cl. 417-363.000.

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Spengler, Ernst Maximilian, 4,106,379, Cl. 83-171.000.

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Bishop, Bruce J.; and Moon, Allen J., 4,106,901, Cl. 8-139.000.

Statni vyzkumny ustav textilni Liberec: *See—*
Horacek, Oldrich; Silar, Frantisek; and Rychlik, Dalibor, 4,106,531, Cl. 139-383.00B.

Stayner, Robert A.; Fox, Richard C.; and Jones, Thornton K., to Chevron Research Company. Chlorinated wax flux compositions. 4,106,958, Cl. 148-23.000.

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Henning, John C., 4,106,166, Cl. 28-103.000.

Stearns, Richard S.; Frankel, Neil A.; and Hollstein, Elmer J., to Suntech, Inc. Preparation of thermoplastic polymer fibrilla and fibril. 4,107,243, Cl. 264-13.000.

Steed, Trevor Ashton, to Harry M. Miller Attractions Pty. Limited. Cutting means. 4,106,194, Cl. 30-228.000.

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Kaufmann, Frank H., 4,106,529, Cl. 139-92.000.

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Bache, William Harry, 4,106,172, Cl. 29-159.010.

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Montgomery, Murray Mathews; Gilger, William Francis; and Steiner, William Winfield, 4,106,639, Cl. 214-14.000.

Stella, Leo: *See*—
Marola, Americo Edward; and Stella, Leo, 4,106,826, Cl. 308-187.000.

Stelmack, Edward A.: *See*—
Malacheski, Joseph J.; and Stelmack, Edward A., 4,106,747, Cl. 251-84.000.

Stephan, Alfred: *See*—
Asztalos, Stefan; Stephan, Alfred; and Mayer, Reinhold, 4,106,796, Cl. 285-133.00R.

Steprath, Werner: *See*—
Buzga, Heinrich; Steprath, Werner; and Pause, Kurt, 4,106,518, Cl. 134-104.000.

Sterling Drug Inc.: *See*—
Bailey, Denis M., 4,107,313, Cl. 424-263.000.
Lesher, George Y.; and Opalka, Chester J., Jr., 4,107,315, Cl. 424-263.000.
Lorenz, Roman R.; and Thielking, William H., 4,107,167, Cl. 260-295.00R.

Stern, Marvin A.: *See*—
Rossi, John P.; and Stern, Marvin A., 4,107,739, Cl. 358-167.000.

Sterzel, Hans-Josef: *See*—
Wurmb, Rolf; Seydl, Wolfgang; Penzien, Klaus; Gausepohl, Hermann; and Sterzel, Hans-Josef, 4,107,231, Cl. 260-873.000.

Stewart, Patrick H.: *See*—
Kloster, William R.; and Stewart, Patrick H., 4,106,545, Cl. 164-18.000.

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Stieff, Lorin R. Fiber optic seal. 4,106,849, Cl. 350-96.240.

Stinger, Kenneth R.: *See*—
McTeague, Gerald E.; and Stinger, Kenneth R., 4,106,937, Cl. 96-36.100.

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Stone, Charles W., to Reed Tool Co. Pneumatic impact drilling tool. 4,106,571, Cl. 173-64.000.

Stone, Russell L., Jr., to General Electric Company. Temperature compensator for a crystal oscillator. 4,107,629, Cl. 331-116.00R.

Stork Brabant B.V.: *See*—
Anselrode, Lodewijk, 4,107,003, Cl. 204-16.000.

Stoy, Vladimir, to Ceskoslovenska akademie ved. Ionogenic hydrophilic water-insoluble gels from partially hydrolyzed acrylonitrile polymers and copolymers, and a method of manufacturing same. 4,107,121, Cl. 260-29.6AB.

Strand, David A.: *See*—
Chang, Yew C.; Ovshinsky, Stanford R.; and Strand, David A., 4,106,939, Cl. 96-48.00R.

Strauch, Raymond; and Riffiod, Michel, to Telecommunications Radioelectriques et Telephoniques T.R.T. Frequency modulator for high-precision range measurements. 4,107,679, Cl. 343-7.500.

Strempel, Thomas G.; and Hora, Charles J., to Diamond Shamrock Corporation. Wafer electrode for an electrolytic cell. 4,107,022, Cl. 204-265.000.

Strobe, Carl J.; and Wells, Robert A. Easy-open container with flange push-in member. 4,106,662, Cl. 220-268.000.

Strohn, Helmut: *See*—
Heinrich, Hans Juergen; Rademacher, Karl August; Strohn, Helmut; and Kramer, Friedhelm, 4,107,042, Cl. 210-225.000.

Stromberg Datagraphix, Inc.: *See*—
Corpew, Charles Robert, 4,107,582, Cl. 315-365.000.

Strong, Jerry G., to Mobil Oil Corporation. 3-(3,4-Epoxy-4-methylcyclohexyl)butyl esters. 4,107,185, Cl. 260-348.550.

Strother, Fred Pickett: *See*—
Blackstone, James Otto, Jr.; and Strother, Fred Pickett, 4,106,416, Cl. 112-79.00A.

Struble, Dean L.: *See*—
Swailes, G. Edward; and Struble, Dean L., 4,107,293, Cl. 424-84.000.

Strunc, Gerald R.; and Osby, Warren J., to Pako Corporation. Semi automatic film cutter with movable cursor. 4,106,685, Cl. 226-136.000.

Stubbings, James Henry, to Potomac Applied Mechanics, Inc. Angle iron cutting. 4,106,380, Cl. 83-212.000.

Studtmann, George Henry, to Borg-Warner Corporation. Torque transducer with closely coupled primary windings. 4,106,334, Cl. 73-136.00A.

Sturlason, Leif Viggo: *See*—
Hansen, Gunnar Lyshoj; and Sturlason, Leif Viggo, 4,106,883, Cl. 418-61.00B.

Sturman, Oded E.; and Grill, Benjamin, to Burwell, Clifton J., a part interest. Fluid control system and controller and moisture sensor therefor. 4,107,546, Cl. 307-141.000.

Sturwold, Robert J.; and Williams, Mark A., to Emery Industries, Inc. Amino-amide lubricants derived from polymeric fatty acids and poly(oxyethylene) diamines. 4,107,061, Cl. 252-49.300.

Stut, Hans, to Siemens Aktiengesellschaft. Method and device for crucible-free floating zone melting. 4,107,448, Cl. 13-26.000.

Styslinger, James R.: *See*—
Ennis, Bernard P., Jr.; and Styslinger, James R., 4,107,226, Cl. 260-683.00R.

Suda, Nobuaki: *See*—
Takahashi, Nobuaki; Nishikawa, Kazunori; Iwasaki, Yoshiki; Satoh, Masaaki; Ohba, Katsuhiro; Nakamura, Shinji; Sawada, Tatsuo; Ohsaki, Nobuhide; Itoh, Yasuo; Suda, Nobuaki; Okabe, Yasuhisa; and Ozaki, Hideaki, 4,107,478, Cl. 179-100.4ST.

Sudol, Frank D.: *See*—
Partain, Wilbur A.; and Sudol, Frank D., 4,106,735, Cl. 248-119.00R.

Sugai, Yoshiro, to Pioneer Electronic Corporation. Muting control circuit for FM receiver. 4,107,614, Cl. 325-348.000.

Sugimura, Hideo: *See*—
Tashiro, Yasuhisa; Sugimura, Hideo; Arai, Toshiaki; Suzuki, Masao; and Shirai, Tadashi, 4,107,203, Cl. 260-518.00R.

Sukornick, Bernard; Minhas, Pritam Singh; and Sweeney, Richard Francis, to Allied Chemical Corporation. Fabric coating compositions, method and coated fabric having dry soil resist finishes. 4,107,055, Cl. 252-8.600.

Sullivan, Ann Clare: *See*—
Gallo-Torres, Hugo; Hamilton, James Guthrie; Rosen, Perry; and Sullivan, Ann Clare, 4,107,188, Cl. 260-397.100.

Sullivan, James D., Jr.; and Watson, Stanley W., to Associates of Cape Cod, Inc. Limulus lysate of improved sensitivity and preparing the same. 4,107,077, Cl. 252-408.000.

Sultanian, Ishkhan V.; and Irani, Joseph H. Radioimmunoassay procedure using a stabilized complex. 4,107,284, Cl. 424-1.000.

Sumitomo Chemical Company, Limited: *See*—
Sano, Takezo; Shimomura, Takatoshi; Sasaki, Masao; and Murase, Ichiki, 4,107,049, Cl. 210-490.000.

Sumiyoshi, Masaharu: *See*—
Noguchi, Masaaki; Sumiyoshi, Masaharu; Tanaka, Yukiyasu; and Tanaka, Taro, 4,106,448, Cl. 123-119.0LR.

Summerhays, Roger P.: *See*—
Emmett, Robert C., Jr.; Heden, Stanley D.; and Summerhays, Roger P., 4,107,028, Cl. 209-5.000.

Summers, David A., to University of Missouri, The Curators of the. Hydromechanical drilling device. 4,106,577, Cl. 175-340.000.

Sumrell, Gene: *See*—
Bailey, August V.; Boudreaux, Gordon J.; Sumrell, Gene; and Novak, Arthur F., 4,107,192, Cl. 260-410.500.

Sun Oil Company of Pennsylvania: *See*—
Myers, Harry K., Jr.; and Schneider, Abraham, 4,107,198, Cl. 260-464.000.

Sunamori, Takashi; and Nishii, Noboru, to Mitsubishi Rayon Co., Ltd. Process for preparing gel polymer of vinyl compound and gel polymer thereof. 4,107,156, Cl. 526-91.000.

Sundberg, Yngve, to ASEA Aktiebolag. Method for inductively stirring molten steel in a continuously cast steel strand. 4,106,546, Cl. 164-49.000.

Sunder, Shyam; and Peet, Norton P., to Dow Chemical Company, The. Substituted N-(2-hydroxyethyl)morpholino carboxamides. 4,107,436, Cl. 544-169.000.

Suntech, Inc.: *See*—
Schneider, Abraham; and Ware, Richard E., 4,107,223, Cl. 260-666.0PY.
Stearns, Richard S.; Frankel, Neil A.; and Hollstein, Elmer J., 4,107,243, Cl. 264-13.000.

Sunworks, Inc.: *See*—
Barber, Everett M., Jr., 4,106,483, Cl. 126-271.000.

Suschaya, Larisa Emmanuilovna: *See*—
Bondar, Petr Grigorievich; Goroshko, Oleg Nikolaevich; Suschaya, Larisa Emmanuilovna; Lavrova, Valentina Vasilievna; Leleka, Valentina Emmanuilovna; and Ilko, Eduard Grigorievich, 4,107,089, Cl. 252-465.000.

Sutehall, Donald, to Gerrard Industries Limited. Band feed guides. 4,106,403, Cl. 100-25.000.

Suzuki, Atsushi; and Jeser, Jean-Pierre, to Hitachi, Ltd. Fluorescent material. 4,107,273, Cl. 423-263.000.

Suzuki, Hideo: *See*—
Murata, Atsuo; Tsuchiya, Shuji; Suzuki, Hideo; and Ikeda, Hisao, 4,107,219, Cl. 568-875.000.

Suzuki, Hideyuki: *See*—
Yamada, Masatoshi; Oshima, Yujiro; Hattori, Katsuhiko; and Suzuki, Hideyuki, 4,106,446, Cl. 123-90.130.

Suzuki, Masao: *See*—
Tashiro, Yasuhisa; Sugimura, Hideo; Arai, Toshiaki; Suzuki, Masao; and Shirai, Tadashi, 4,107,203, Cl. 260-518.00R.

Suzuki, Motoaki: *See*—
Koshiga, Fusao; Tanaka, Jinkichi; Watanabe, Itaru; Suzuki, Motoaki; Kojima, Toshifumi; Matsubara, Hiroyoshi; Osuka, Tatsumi; Takeshige, Kenji; Nagamine, Takashi; and Hirano, Osamu, 4,107,503, Cl. 219-61.000.

Suzuki, Naoto: *See*—
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Suzuki, Nobuyuki; Kobayashi, Yukinari; Hiyoshi, Yumiko; Takagi, Seiji; Sone, Takanori; Wakabayashi, Mikio; and Sowa, Tuneo, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for preparing N_1-(2'-furanidyl)-5-fluorouracil. 4,107,162, Cl. 544-313.000.

Suzuki, Shuzo; Furuhashi, Keizo; and Taoka, Akira, to Bio Research Center Company, Ltd. Manufacture of epoxide using a microorganism. 4,106,986, Cl. 195-28.00R.

Suzuki, Takami; and Iwata, Nobuo, to Ricoh Company, Ltd. Serial printing apparatus. 4,106,611, Cl. 400-144.200.
Suzuki, Teruki: *See—*
Tanimizu, Shinkichi; Suzuki, Teruki; and Fukuzawa, Tadashi, 4,107,571, Cl. 313-486.000.
Suzuki, Yasuo; Takagahara, Isamu; Fujita, Tsuyoshi; Fujii, Katsumi; and Horio, Takekazu, to Oriental Yeast Co. Ltd. Isoelectric point markers for gel isoelectric separation. 4,107,014, Cl. 204-180.00R.
Svenska Utvecklingsaktiebolaget: *See—*
Erlandsson, Bjorn Erik, 4,106,511, Cl. 128-407.000.
Svensson, Lennart. Lintel for supporting e.g. arches over wall openings, facade coverings and similar. 4,106,247, Cl. 52-204.000.
Swailes, G. Edward; and Struble, Dean L., to Canadian Patents and Development Limited. Attractant for darksided cutworm moth. 4,107,293, Cl. 424-84.000.
Swartz, Delbert D.: *See—*
McRoskey, John W.; McRoskey, Leonard H.; and Swartz, Delbert D., 4,106,704, Cl. 239-685.000.
Sweeney, Charles E.: *See—*
Allen, William W.; Sweeney, Charles E.; Lundquist, Alvin G., Jr.; and Hersh, Raymond T., 4,106,227, Cl. 38-143.000.
Sweeney, Richard Francis: *See—*
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Sweigart, James H.: *See—*
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Swin, Richard E., Sr. Method for molding dynamically balanced fans. 4,107,257, Cl. 264-328.000.
Swiss Aluminium Ltd.: *See—*
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Sybron Corporation: *See—*
Cook, Ronald Janney, 4,106,159, Cl. 16-146.000.
Trietley, Harry Louis, Jr., 4,106,337, Cl. 73-194.0EM.
Sylten, Hans D.: *See—*
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Symons Corporation: *See—*
Cody, David L., 4,106,256, Cl. 52-646.000.
Synthes AG Chur: *See—*
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Szabolcs, Otto; and Schuller, Hans, to Isovolta Osterreichische Isolierstoffwerke Aktiengesellschaft. Method of producing polymers of high molecular weight by the two-phase interfacial method. 4,107,409, Cl. 526-65.000.
Sze, Morgan C.; Riegel, Herbert; and Schindler, Harvey D., to Lummus Company, The. Oxychlorination of methane. 4,107,222, Cl. 260-659.00A.
Szentmihaly, Charles, to BTR Industries Limited. High temperature end fitting. 4,106,526, Cl. 138-109.000.
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Tabuchi, Hideho; and Ogushi, Akira, to Hitachi, Ltd. Apparatus for measuring a concentration of radioactivity. 4,107,533, Cl. 250-364.000.
Taga, Yutaka, to Toyota Jidosha Kogyo Kabushiki Kaisha. Oil pressure control system for an automatic transmission system. 4,106,369, Cl. 74-869.000.
Takagahara, Isamu: *See—*
Suzuki, Yasuo; Takagahara, Isamu; Fujita, Tsuyoshi; Fujii, Katsumi; and Horio, Takekazu, 4,107,014, Cl. 204-180.00R.
Takagi, Seiji: *See—*
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Takahara, Kazuo: *See—*
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Takahashi, Akio; Saito, Hirokichi; and Oyaizu, Yoshijiro, to Ihara Chemical Company Co., Ltd. Process for producing urethane elastomer. 4,107,151, Cl. 528-54.000.
Takahashi, Nobuaki; Nishikawa, Kazunori; Iwasaki, Yoshiki; Satoh, Masaaki; Ohba, Katsuhiro; Nakamura, Shinji; Sawada, Tatsuo; Ohsaki, Nobuhide; Itoh, Yasuo; Suda, Nobuaki; Okabe, Yasuhisa; and Ozaki, Hideaki, to Victor Company of Japan, Limited. Angle modulated wave demodulation system. 4,107,478, Cl. 179-100.4ST.
Takahashi, Nobuo: *See—*
Takahashi, Yuzo; Tanaka, Yasuyuki; Nagai, Katsumi; Takahashi, Nobuo; Matsuda, Hiroshi; Ono, Koichi; Tanaka, Kozi; and Oyama, Shiro, 4,106,420, Cl. 113-12.000.
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Takahashi, Yoshiyuki; Nagai, Akihiko; Kawawa, Shigenobu; Kubozono, Hidetaka; and Tanaka, Mitsuo, to Anritsudenki Kabushikigaisha. Solid or water quantity measurement apparatus using microwaves. 4,106,329, Cl. 73-15.00B.
Takahashi, Yuzo; Tanaka, Yasuyuki; Nagai, Katsumi; Takahashi, Nobuo; Matsuda, Hiroshi; Ono, Koichi; Tanaka, Kozi; and Oyama, Shiro, to Hokkai Can Co., Ltd. Apparatus for forming cans. 4,106,420, Cl. 113-12.000.
Takamisawa, Hiroshi: *See—*
Hirota, Tetsuya; Hishida, Tadashi; Kamata, Akira; Nakazawa, Isao; and Takamisawa, Hiroshi, 4,106,993, Cl. 195-65.000.
Takamura, Tsutomu; and Shirogami, Tamotsu, to Tokyo Shibaura Electric Co., Ltd. Electrochemical cell. 4,107,403, Cl. 429-174.000.
Takao, Hiroshi; and Matoba, Kazuo, to Nissan Motor Company, Limited. Solid electrolyte thin film oxygen sensor having thin film heater. 4,107,019, Cl. 204-195.00S.
Takao, Hiroshi: *See—*
Aoki, Hiroyuki; Takao, Hiroshi; and Oyamada, Akira, 4,107,392, Cl. 428-547.000.
Takata, Akira: *See—*
Hattori, Tadashi; Takata, Akira; Fukuda, Tamotsu; and Nakase, Takamichi, 4,106,451, Cl. 123-119.0EC.
Takeda, Yoshiaki. Presettable metering valve. 4,106,670, Cl. 222-20.000.
Takeshige, Kenji: *See—*
Koshiga, Fusao; Tanaka, Jinkichi; Watanabe, Itaru; Suzuki, Motoaki; Kojima, Toshifumi; Matsubara, Hiroyoshi; Osuka, Tatsumi; Takeshige, Kenji; Nagamine, Takashi; and Hirano, Osamu, 4,107,503, Cl. 219-61.000.
Takeuchi, Akihiro: *See—*
Asai, Kiyokazu; and Takeuchi, Akihiro, 4,106,459, Cl. 123-141.000.
Takeuchi, Daizo: *See—*
Ohsugi, Katsuhisa; Takeuchi, Daizo; Hamada, Masahiro; and Kano, Tamotsu, 4,106,988, Cl. 195-49.000.
Takeuchi, Masato: *See—*
Mori, Toshikatsu; Takeuchi, Masato; Hitomi, Otane; Uno, Shigeo; Imahashi, Jinichi; and Nakajima, Fumito, 4,107,272, Cl. 423-239.000.
Takizawa, Kazuyuki, to Sony Corporation. Phonograph record player. 4,106,775, Cl. 274-15.00R.
Talbott, Earl Raymond. Recreational vehicle for use on sloping terrains. 4,106,786, Cl. 280-8.000.
Tamamura, Ryo: *See—*
Nomaki, Koji; Saoyama, Yoshihito; and Tamamura, Ryo, 4,106,930, Cl. 75-134.00B.
Tamura, Noriyoshi; and Kihara, Kunio, to Mitsubishi Petrochemical Company Limited. Anion-exchange resins. 4,107,098, Cl. 521-25.000.
Tamura, Takeo, to Tanabe Shiko Kikai Seizo Kabushiki Kaisha. Cardboard-feeding device. 4,106,764, Cl. 271-35.000.
Tanabe Shiko Kikai Seizo Kabushiki Kaisha: *See—*
Tamura, Takeo, 4,106,764, Cl. 271-35.000.
Tanahashi, Jun'ichi; and Kanie, Takashi, to Fujitsu Limited. Error correcting and controlling system. 4,107,652, Cl. 340-146.1AL.
Tanahashi, Toshio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Internal combustion engine with a subsidiary combustion chamber. 4,106,467, Cl. 123-191.0SP.
Tanaka, Harumi, to Minolta Camera Kabushiki Kaisha. Filmstrip metering device for a camera. 4,107,715, Cl. 354-206.000.
Tanaka, Hiroyoshi; Koseki, Teruo; and Fujii, Shigeru, to Toray Industries, Inc. Antistatic acrylic fiber. 4,107,129, Cl. 260-40.00P.
Tanaka, Jinkichi: *See—*
Koshiga, Fusao; Tanaka, Jinkichi; Watanabe, Itaru; Suzuki, Motoaki; Kojima, Toshifumi; Matsubara, Hiroyoshi; Osuka, Tatsumi; Takeshige, Kenji; Nagamine, Takashi; and Hirano, Osamu, 4,107,503, Cl. 219-61.000.
Tanaka, Junzo; and Kai, Toshio, to Matsushita Electric Industrial Co., Ltd. Microwave oven. 4,107,502, Cl. 219-10.55F.
Tanaka, Kozi: *See—*
Takahashi, Yuzo; Tanaka, Yasuyuki; Nagai, Katsumi; Takahashi, Nobuo; Matsuda, Hiroshi; Ono, Koichi; Tanaka, Kozi; and Oyama, Shiro, 4,106,420, Cl. 113-12.000.
Tanaka, Kyuichi: *See—*
Nakamura, Toshiie; Shimizu, Hiromichi; Tanaka, Kyuichi; Kunitomo, Akihiko; and Tanizawa, Kinji, 4,107,300, Cl. 424-200.000.
Tanaka, Mithunobu: *See—*
Saito, Tamekazu; Tanaka, Mithunobu; Saito, Yutaka; and Sakaue, Kenich, 4,106,929, Cl. 75-130.500.
Tanaka, Mitsugu; Nakazyo, Kiyoshin; and Arai, Atsuaki, to Fuji Photo Film Co., Ltd. Silver halide emulsion containing yellow color couplers. 4,106,942, Cl. 96-100.00N.
Tanaka, Mitsuo: *See—*
Takahashi, Yoshiyuki; Nagai, Akihiko; Kawawa, Shigenobu; Kubozono, Hidetaka; and Tanaka, Mitsuo, 4,106,329, Cl. 73-15.00B.
Tanaka, Takeji: *See—*
Atsukawa, Masumi; Shinoda, Naoharu; and Tanaka, Takeji, 4,107,271, Cl. 423-235.000.
Tanaka, Taro: *See—*
Noguchi, Masaaki; Sumiyoshi, Masaharu; Tanaka, Yukiyasu; and Tanaka, Taro, 4,106,448, Cl. 123-119.0LR.
Tanaka, Yasuyuki: *See—*
Takahashi, Yuzo; Tanaka, Yasuyuki; Nagai, Katsumi; Takahashi, Nobuo; Matsuda, Hiroshi; Ono, Koichi; Tanaka, Kozi; and Oyama, Shiro, 4,106,420, Cl. 113-12.000.
Tanaka, Yukiyasu: *See—*
Noguchi, Masaaki; Sumiyoshi, Masaharu; Tanaka, Yukiyasu; and Tanaka, Taro, 4,106,448, Cl. 123-119.0LR.
Tanazawa, Masao: *See—*
Tsuzuku, Akihiko; Tanazawa, Masao; Kaminishi, Masashi; and Imamura, Haruo, 4,106,817, Cl. 302-17.000.
Tani, Tatsuo; and Kameyama, Toshiaki, to Ricoh Company, Ltd. Cassette type sheet feed apparatus for copying machine or the like. 4,106,763, Cl. 271-9.000.
Taniguchi, Koichi: *See—*
Arai, Hiroshi; and Taniguchi, Koichi, 4,107,646, Cl. 340-52.00F.
Tanimizu, Shinkichi; Suzuki, Teruki; and Fukuzawa, Tadashi, to Hitachi, Ltd. Light emitting device having luminescent screen with self activated blue light emitting phosphor. 4,107,571, Cl. 313-486.000.

Tanioka, Katsuhiko: *See—*
Murai, Sadao; Goto, Nobuo; Tanioka, Katsuhiko; Matsunaga, Masaaki; and Isayama, Riyoiti, 4,107,249, Cl. 264-68.000.
Taniyasu, Ryozo; Kurokawa, Hideo; and Saito, Takeshi, to Lion Fat and Oil Company Limited, The. Process for preparing catalyst for olefin polymerization. 4,107,080, Cl. 252-431.00C.
Tanizawa, Kinji: *See—*
Nakamura, Toshiie; Shimizu, Hiromichi; Tanaka, Kyuichi; Kunitomo, Akihiko; and Tanizawa, Kinji, 4,107,300, Cl. 424-200.000.
Tankred, Hans Jurgen: *See—*
Stannow, Jorgen Christian; and Tankred, Hans Jurgen, 4,106,881, Cl. 417-363.000.
Taoka, Akira: *See—*
Suzuki, Shuzo; Furuhashi, Keizo; and Taoka, Akira, 4,106,986, Cl. 195-28.00R.
Tarran, Phil Keith, to Lords III Research & Development Co. Combined hand truck and ladder. 4,106,590, Cl. 182-20.000.
Tashiro, Yasuhisa; Sugimura, Hideo; Arai, Toshiaki; Suzuki, Masao; and Shirai, Tadashi, to Nippon Kayaku Kabushiki Kaisha. Optical resolution of DL-α-phenylglycine hydrochloride. 4,107,203, Cl. 260-518.00R.
Tasto, William D.; and Morris, Thomas E., to Dow Chemical Company, The. Removal of olefin oxide from chlorinated solvents. 4,107,221, Cl. 260-652.00P.
Tatco Inc.: *See—*
Thomas, Thomas, 4,106,678, Cl. 224-5.00D.
Tatsuma, Junji: *See—*
Yoshino, Tsuneo; and Tatsuma, Junji, 4,107,052, Cl. 210-534.000.
Taupin, Jean-Paul. Eye-shades. 4,106,119, Cl. 2-12.000.
Tausch, Gilbert H., to Camco, Incorporated. Sidepocket mandrel. 4,106,564, Cl. 166-117.500.
Tausch, Gilbert H.: *See—*
Gatlin, Alvin O.; Tausch, Gilbert H.; and Watkins, Fred E., 4,106,563, Cl. 166-117.500.
Taylor, Allen L., to Minnesota Mining and Manufacturing Company. Piezoelectric method and medium for producing electrostatic charge patterns. 4,106,933, Cl. 96-1.50R.
Taylor, David Michael: *See—*
Everts, Clifford Leon; Taylor, David Michael; and Delmore, Paul John, 4,107,070, Cl. 252-301.40S.
Taylor, Glenn N., to Kendall Company, The. Liquid sampling device. 4,106,675, Cl. 222-556.000.
Taylor-Smith, Ernest J. Automatic apparatus for laying block anita. 4,106,259, Cl. 52-749.000.
Taylor Winfield Corporation, The: *See—*
Toma, Charles A.; and Haessly, Walter F., 4,107,491, Cl. 200-61.420.
Tecco, Charles; and Lasich, Lawrence E., to Weatherchem Corporation. Resealable end closure having plural openings. 4,106,672, Cl. 222-151.000.
Tehan, Frederick J.: *See—*
Dye, James L.; Ceraso, Joseph M.; Tehan, Frederick J.; and Lok, Mei Tak, 4,107,180, Cl. 260-338.000.
Teijin Limited: *See—*
Inata, Hiroo; Morinaga, Tsuto; Kuratsuji, Takatoshi; Urasaki, Takanori; and Kawase, Shoji, 4,107,143, Cl. 528-176.000.
Tektronix, Inc.: *See—*
McTeague, Gerald E.; and Stinger, Kenneth R., 4,106,937, Cl. 96-36.100.
McTeague, Gerald E.; and Stinger, Kenneth R., 4,106,937, Cl. 96-36.100.
Telecommunications Radioelectriques et Telephoniques T.R.T.: *See—*
Strauch, Raymond; and Riffiod, Michel, 4,107,679, Cl. 343-7.500.
Teledyne Brown Engineering, a Division of Teledyne Industries, Inc.: *See—*
Ortell, Alexander Rudolph, 4,106,727, Cl. 244-49.000.
Teledyne Industries, Inc.: *See—*
Corder, Thomas E., 4,107,046, Cl. 210-282.000.
Teleflex Incorporated: *See—*
Parsons, William H., 4,106,168, Cl. 29-148.40C.
Telefonaktiebolaget L M Ericsson: *See—*
Carlqvist, Bengt Roland; and Eriksson, Anders Gunnar, 4,107,475, Cl. 179-84.0VF.
Teletype Corporation: *See—*
Campe, William T., 4,107,595, Cl. 318-696.000.
Jacobs, Norman A., 4,107,594, Cl. 318-685.000.
Temco Products, Inc.: *See—*
Thomas, Morton I., 4,106,521, Cl. 135-67.000.
Tenneco Chemicals, Inc.: *See—*
Turnbo, Roy G.; and Purpi, David C., 4,107,230, Cl. 260-861.000.
Tewksbury, Stuart Keene, to Bell Telephone Laboratories, Incorporated. Apparatus for analog to digital conversion. 4,107,669, Cl. 340-347.0AD.
Texaco Development Corp.: *See—*
McEntire, Edward E.; and Gipson, Robert M., 4,107,096, Cl. 252-546.000.
Texaco Inc.: *See—*
Howlett, Donald L., 4,107,644, Cl. 340-18.0CM.
Lachowicz, Donald R.; and Holder, Charles B., 4,107,110, Cl. 260-17.4CL.
Meador, Richard A.; Adams, Larry L.; Cox, Percy T.; Thompson, Larry W.; and Fuchs, James A., 4,107,597, Cl. 324-6.000.
Meador, Richard A.; Adams, Larry L.; Fuchs, James A.; Cox, Percy T.; and Thompson, Larry W., 4,107,598, Cl. 324-6.000.
Slough, Carlton M., 4,107,603, Cl. 324-207.000.
Texas Instruments Incorporated: *See—*
Adcock, Willis A.; and Skaggs, Frank L., 4,107,732, Cl. 358-43.000.
Barrett, Johnny M.; and Hamilton, Stephen P., 4,107,781, Cl. 364-700.000.
Bayard, Michel Lucien, 4,106,862, Cl. 350-357.000.
Cochran, Michael J., 4,107,782, Cl. 364-706.000.
Gilbreath, Cecil R.; and Womble, Jimmie L., 4,107,773, Cl. 364-200.000.
Kronlage, John W., 4,107,667, Cl. 340-347.0NT.
Kulwicki, Bernard Michael, 4,107,515, Cl. 219-541.000.
Texas Iron Works, Inc.: *See—*
Braddick, Britt O., 4,106,565, Cl. 166-118.000.
Texacan Corporation: *See—*
Dawson, William P., 4,107,632, Cl. 333-81.00A.
Textron, Inc.: *See—*
McKeown, William L., 4,106,332, Cl. 73-104.000.
Teyin Limited: *See—*
Inata, Hiroo; Morinaga, Tsuto; Kuratsuji, Takatoshi; Urasaki, Takanori; and Kawase, Shoji, 4,107,143, Cl. 528-176.000.
Thackray, Philip C. Ballast circuit for gas glow discharge devices. 4,107,580, Cl. 315-311.000.
Thermal Transfer, Division of Kleinewefers: *See—*
Heyn, Fred M.; Yin, Ching-Feng; Hanson, Gordon L.; and Schreck, Robert C., 4,106,556, Cl. 165-81.000.
Thiel, Ralph. Latching means for a free spool retrieval and spin type casting reel. 4,106,717, Cl. 242-84.20B.
Thiel, William A.; and Dziedzic, Harry, to Rank Precision Industries, Inc. Lamp adapting kit. 4,107,763, Cl. 362-32.000.
Thielking, William H.: *See—*
Lorenz, Roman R.; and Thielking, William H., 4,107,167, Cl. 260-295.00R.
Thomas International Corporation: *See—*
Roberts, Patrick S., 4,106,385, Cl. 84-1.240.
Thomas, Morton I., to Temco Products, Inc. Collapsible cane apparatus. 4,106,521, Cl. 135-67.000.
Thomas, Norman W., to Celanese Corporation. Sintered herbicide-filled cellulose ester particles having improved resistance to water leaching. 4,106,926, Cl. 71-115.000.
Thomas, Robert F.: *See—*
Cox, Jerry H.; and Thomas, Robert F., 4,106,355, Cl. 74-99.00A.
Thomas, Thomas, to Tatco Inc. Golf ball and tee caddy. 4,106,678, Cl. 224-5.00D.
Thomassen en Drijver-Verblifa N.V.: *See—*
Heijting, Hendrik Gerrit, 4,106,655, Cl. 214-341.000.
Thompson, Larry W.: *See—*
Meador, Richard A.; Adams, Larry L.; Cox, Percy T.; Thompson, Larry W.; and Fuchs, James A., 4,107,597, Cl. 324-6.000.
Meador, Richard A.; Adams, Larry L.; Fuchs, James A.; Cox, Percy T.; and Thompson, Larry W., 4,107,598, Cl. 324-6.000.
Thompson, Neil E. S.: *See—*
Oude Alink, Bernardus A.; and Thompson, Neil E. S., 4,106,904, Cl. 21-2.70R.
Thomson, Ian Main. Conveyor belts. 4,106,613, Cl. 198-847.000.
Thon, Dieter, to Safety Jet. Device for locking a removable ski crossing deflector. 4,106,787, Cl. 280-11.37E.
Thor Dahl, Inc.: *See—*
Gunther, William H., Jr., 4,106,432, Cl. 118-211.000.
Thornton, David Charles; Lightner, Linn Stephen; and Lannan, Patrick Edward, to AMP Incorporated. Interconnect device for use in closed fluid circulating systems. 4,106,523, Cl. 137-614.040.
Thorp, Jeffrey Meyrick: *See—*
Haydock, David Bryan; Mulholland, Thomas Patrick Cunningham; and Thorp, Jeffrey Meyrick, 4,107,329, Cl. 424-317.000.
Threshold Corporation: *See—*
Pass, Nelson S., 4,107,619, Cl. 330-255.000.
Threshold Technology, Inc.: *See—*
Grunza, Gene; and Herscher, Marvin B., 4,107,460, Cl. 179-1.0SD.
Thurman, Paul G., to Dare Pafco, Inc. Tray structure. 4,106,624, Cl. 206-507.000.
Tideswell, Richard B.; and Selley, Jeffrey E., to Hooker Chemicals & Plastics Corporation. Polyurethane acrylates of hydroxyalkylated novolac resin. 4,107,229, Cl. 260-841.000.
Tilly, Guy; Hardouin, Michel Jean-Charles; and Lautrou, Jean, to Guerbet S.A. Polyiods benzene derivatives and X-ray contrast media containing the same. 4,107,286, Cl. 424-5.000.
Tilson, Edward Arthur; and Mayhew, Raymond Leonard, to Caribonum Limited. Transfer materials. 4,107,327, Cl. 428-304.000.
Time Computer, Inc.: *See—*
Garrison, Donald W.; and Hartman, James T., 4,106,277, Cl. 58-4.00A.
Timex Corporation: *See—*
Grohoski, Raymond J., 4,107,400, Cl. 429-98.000.
Timofeeva, Venera Fatykhovna: *See—*
Fasman, Anatoly Borisovich; Sokolsky, Dmitry Vladimirovich; Rutman, Grigory Iosifovich; Michurov, Jury Ivanovich; Zavorin, Viktor Anatolievich; Shalimova, Zoya Stepanovna; Timofeeva, Venera Fatykhovna; Dautov, Tulkibai Galikbarovich; Bazhakov, Daniel Kalimullovich; and Sivakov, Jury Mikhailovich, 4,107,090, Cl. 252-465.000.
Tippin, Arthur D., to Chubb & Son's Lock and Safe Company Limited. Keyless combination locks. 4,106,316, Cl. 70-268.000.
Tobin, John H., to Olin Corporation. Process for producing 3-trichloromethyl-5-loweralkylamino-1,2,4-thiadiazole. 4,107,377, Cl. 260-306.80D.
Toekes, Barna, to Polysar Resins, Inc. Polymerization column and

method of polymerizing vinylidene compounds. 4,107,410, Cl. 526-73.000.

Tokyo Electric Power Co., Inc., The: *See—*
Ishida, Yotsuo; and Kuwahara, Hiroshi, 4,107,754, Cl. 361-120.000.
Nii, Yoshiji; Matsuda, Takayuki; Yamazaki, Yoichi; and Nohara, Haruo, 4,107,778, Cl. 364-492.000.

Tokyo Rope Mfg. Co. Ltd.: *See—*
Hosoya, Kiyoshi, 4,106,276, Cl. 57-147.000.

Tokyo Shibaura Electric Co., Ltd.: *See—*
Isojima, Tsuyoshi; Enokida, Kenji; Nihei, Hideharu; and Ichise, Wataru, 4,107,565, Cl. 313-174.000.
Nishijima, Tadashi, 4,107,654, Cl. 340-147.0MT.
Takamura, Tsutomu; and Shirogami, Tamotsu, 4,107,403, Cl. 429-174.000.

Toledo Pickling & Steel Service, Inc.: *See—*
Hansen, Lars J., 4,107,267, Cl. 423-138.000.

Toma, Charles A.; and Haessly, Walter F., to Taylor Winfield Corporation, The. Welding machine spacer plate with sensors. 4,107,491, Cl. 200-61.420.

Tombs, Terence Leslie; Miles, Brian Leslie; and Smith, Dexter William, to C.A.V. Limited. Starting aids for combustion engines. 4,107,510, Cl. 219-270.000.

Tomecek, Charles J.: *See—*
McCandless, William; Leu, Robert F.; Kroder, Ernest A.; and Tomecek, Charles J., 4,106,242, Cl. 51-225.000.

Tomita, Sadami: *See—*
Watanabe, Ryuji; Sato, Syoichi; and Tomita, Sadami, 4,106,627, Cl. 209-7.000.

Tomita, Yasuo: *See—*
Iwasaki, Hajime; and Tomita, Yasuo, 4,107,375, Cl. 428-291.000.

Tomlinson, Colin Henry, to Rochester Instrument Systems Limited. Optimum start controller. 4,106,690, Cl. 236-46.00R.

Tomono, Makoto; Yamakawa, Goichi; and Ohta, Mitsunori, to Konishiroku Photo Industry Co., Ltd. Toner for developing electrostatic latent images comprising an amine-epoxy resin mixture. 4,107,062, Cl. 252-62.10P.

Tomy Kogyo Co., Inc.: *See—*
Kanno, Hideyuki, 4,106,768, Cl. 273-1.00M.

Toray Industries, Inc.: *See—*
Tanaka, Hiroyoshi; Koseki, Teruo; and Fujii, Shigeru, 4,107,129, Cl. 260-40.00P.

Torbet, Christopher J.; Rice, Warren A.; and Vinton, Clarence S., to Chemotronics International, Inc. Method for the thermal bonding of contacting pieces of a thermoplastic material. 4,106,970, Cl. 156-306.000.

Torii, Masanori: *See—*
Shinoda, Kazuo; and Torii, Masanori, 4,106,456, Cl. 123-119.00E.

Torii, Osamu, to Ancos Co., Ltd. Mechanical pencil. 4,106,874, Cl. 401-67.000.

Torrington Company, The: *See—*
Marola, Americo Edward; and Stella, Leo, 4,106,826, Cl. 308-187.000.

Toshiba Chemical Products Co., Ltd.: *See—*
Akiyama, Keiichi; Kamiuchi, Junichi; Matsuda, Itsuo; and Fujii, Takara, 4,107,153, Cl. 528-322.000.

Totten, George F.; and Harman, Wayne L. Dry gaseous fuel generator. 4,106,457, Cl. 123-133.000.

Tournoy, Willy, to N. V. Bekaert S.A. Reinforcements. 4,106,957, Cl. 148-12.00B.

Towmotor Corporation: *See—*
Buchwald, Frank S.; and Melocik, Grant C., 4,107,586, Cl. 318-426.000.
Hildebrecht, Harold V., 4,106,362, Cl. 74-474.000.

Toyo Boseki Kabushiki Kaisha: *See—*
Fujiyoshi, Kanji; Fukuda, Minoru; Mizumura, Yutaka; Sono, Junji; and Naito, Iori, 4,107,148, Cl. 528-273.000.

Toyo Soda Manufacturing Co., Ltd.: *See—*
Seita, Toru; Asami, Shunichi; and Shimizu, Akihiko, 4,107,097, Cl. 521-32.000.

Toyo Tsushinki Kabushiki Jaka Toyo Communication Equipment Co. Ltd.: *See—*
Funatsu, Chuhei; and Hirata, Toshikiyo, 4,107,674, Cl. 343-6.50R.

Toyoda-Koki Kabushiki-Kaisha: *See—*
Eto, Kunihiko; Niwa, Kuniyuki; and Owa, Kaoru, 4,107,589, Cl. 318-602.000.

Toyoda, Shozo: *See—*
Shimada, Hiroyuki; and Toyoda, Shozo, 4,106,303, Cl. 61-101.000.

Toyomaki, Kazuya, to Victor Company of Japan, Limited. Tone controller. 4,107,622, Cl. 330-302.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Arai, Hiroshi; and Taniguchi, Koichi, 4,107,646, Cl. 340-52.00F.
Bunda, Tsuchio; Niimi, Itaru; Kaneko, Yasuhisa; and Noda, Fumiyoshi, 4,106,913, Cl. 23-288.0FC.
Hattori, Tadashi; Takata, Akira; Fukuda, Tamotsu; and Nakase, Takamichi, 4,106,451, Cl. 123-119.0EC.
Kondo, Osamu, 4,106,353, Cl. 74-45.000.
Matsumoto, Noboru; Kurose, Kunio; and Ueno, Kinya, 4,106,449, Cl. 123-119.00A.
Mizutani, Kohichi, 4,106,452, Cl. 123-119.00A.
Nakamura, Kenya; and Okano, Hiroshi, 4,106,553, Cl. 165-9.000.
Norimatsu, Hideaki; Nakamura, Mitsuo; and Kobayashi, Nobuyuki, 4,106,450, Cl. 123-119.0EC.
Shinoda, Kazuo; and Torii, Masanori, 4,106,456, Cl. 123-119.00E.
Taga, Yutaka, 4,106,369, Cl. 74-869.000.
Tanahashi, Toshio, 4,106,467, Cl. 123-191.0SP.

Toyota Tidoshakogyo Kabushiki Kaisha: *See—*
Ono, Takayoshi, 4,106,666, Cl. 220-373.000.

Traenckner, Hans-Joachim: *See—*
Fuhr, Karl; Traenckner, Hans-Joachim; Rosenkranz, Hans Jurgen; Rufolph, Hans; Patheiger, Manfred; and Haus, Artur, 4,107,012, Cl. 204-159.190.

Traenkle, William J. Within-the-shoe sock having removable retaining device. 4,106,126, Cl. 2-240.000.

Tran, Duc Tien, to CGR-MeV. Controlled-frequency feeding arrangement for a linear accelerator using stationary-wave accelerating sections. 4,107,617, Cl. 328-233.000.

Trane Company, The: *See—*
Saunders, James Fredrick, 4,106,306, Cl. 62-149.000.

Traubel, Harro; Reiff, Helmut; and Dieterich, Dieter, to Bayer Aktiengesellschaft. Leather tanning with oligourethanes. 4,106,897, Cl. 8-94.330.

Traubel, Harro; Reiff, Helmut; and Dieterich, Dieter, to Bayer Aktiengesellschaft. Leather tanning with oligourethanes. 4,106,898, Cl. 8-94.330.

Treadwell, Kenneth: *See—*
Keller, Alfred A.; Russo, Robert V.; and Treadwell, Kenneth, 4,107,069, Cl. 252-182.000.

Trech, Inc.: *See—*
Smith, Robert W., Jr.; and Waite, George C., 4,107,451, Cl. 174-84.00R.

Treczka, Leo: *See—*
Spinner, Georg; and Treczka, Leo, 4,107,631, Cl. 333-17.00R.

Tregoning, Geoffrey Robinson, to Westinghouse Brake and Signal Company Limited. Door mountings. 4,106,876, Cl. 403-4.000.

Treiber, Robert: *See—*
Weaver, Daniel J.; Treiber, Robert; and Wolanow, Avner, 4,107,596, Cl. 323-17.000.

Trentini, Giswalt V.; and Jatsch, Werner, to Siemens Aktiengesellschaft. Antenna arrangement for radar or direction finding purposes respectively, with sum and difference patterns. 4,107,690, Cl. 343-113.00R.

Trietley, Harry Louis, Jr., to Sybron Corporation. Magnetic flow meter nulling system. 4,106,337, Cl. 73-194.0EM.

Tritz, Jean-Marie: *See—*
Schultz, Jean-Pierre; Cuny, Francis; Payraudeau, Daniel; and Tritz, Jean-Marie, 4,107,507, Cl. 219-121.00P.

Triulzi, Joseph P. Rotary internal combustion engine. 4,106,443, Cl. 123-43.00R.

Trongo, George. Bit driving tool for use in barriers separating different environments. 4,106,373, Cl. 81-180.00R.

Trubiano, Antoine, to Cari-All, Inc. Stackable material handling container. 4,106,626, Cl. 206-513.000.

TRW Inc.: *See—*
Hajduk, Thomas M., 4,107,457, Cl. 178-17.500.
Patel, Jayant K., 4,107,559, Cl. 310-49.00R.

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Tuegel, Robert O., to Wagner Electric Corporation. Master cylinder reservoir with vacuum relief diaphragm and guarded fluid level sensor. 4,107,494, Cl. 200-84.00C.

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Turnbo, Roy G.; and Purpi, David C., to Tenneco Chemicals, Inc. Flame-retardant thermosetting resinous compositions. 4,107,230, Cl. 260-861.000.
Turner Manufacturing Company, Ltd.: *See*—
Morrison, William McKenzie Meek, 4,106,358, Cl. 74-331.000.
Turner, Paul F., to Sperry Rand Corporation. Automatic frequency-tracking circuit. 4,107,624, Cl. 331-8.000.
Turri, Eugenio: *See*—
Savio, Ermanno; Calamani, Sergio; and Turri, Eugenio, 4,106,712, Cl. 242-47.010.
Turunen, Johannes: *See*—
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Tutor, Gerald L.; Fruin, James C.; and Helm, James L., to Anheuser-Busch, Incorporated. Batter mix containing floury starch of Fl_2Fl_2 constitution. 4,107,338, Cl. 426-293.000.
Typpo, Pekka Matti; and Wennerberg, Gunnar, to Measurex Corporation. Non-contacting electromagnetic thickness gauge for sheet measurement having improved small distance sensitivity. 4,107,606, Cl. 324-229.000.
Tyson, Charles H., to Raytheon Company. Tube terminal connector assembly. 4,106,840, Cl. 339-145.00R.
Tzeng, J. C. Device and method for three point electro therapy. 4,106,513, Cl. 128-420.00R.
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Ueda, Hiroshi; and Tsujimoto, Kayoshi, to Minolta Camera Kabushiki Kaisha. Camera apparatus. 4,107,706, Cl. 354-31.000.
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Ueda Works Co., Ltd.: *See*—
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Jenkins, Jonathan Moubray; and Henson, Kenneth, 4,107,397, Cl. 429-27.000.
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Angell, Richard Gordon, Jr.; Gross, Laurence Herbert; and Berger, Sidney Ethan, 4,107,258, Cl. 264-328.000.
Dunleavy, Raymond Augustine; and Papa, Anthony Joseph, 4,107,106, Cl. 521-164.000.
Konrad, Frederick Miller; and Mason, Stephen Howard, 4,107,218, Cl. 560-724.000.
Prokai, Bela; and Kanner, Bernard, 4,107,068, Cl. 252-182.000.
Walitalo, Charles Richard, 4,106,733, Cl. 248-100.000.
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Ward, John W., 4,107,031, Cl. 208-111.000.
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Nelsson, Nels, 4,106,251, Cl. 52-765.000.
Porter, William F., 4,106,921, Cl. 65-14.000.
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Administrator, National Aeronautics and Space Administration: *See*—
Dawn, Frederic S.; and Sauers, Dale G., 4,107,363, Cl. 428-109.000.
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Pfeffer, Philip E.; and Moore, Gordon G., 4,107,425, Cl. 536-119.000.
Robertson, George H.; Lazar, Melvin E.; Krochta, John M.; Farkas, Daniel F.; and Bomben, John L., 4,107,340, Cl. 426-481.000.
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Cook, Harry, 4,106,343, Cl. 73-387.000.
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Hunt, Robert E., 4,106,661, Cl. 220-232.000.
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Vig, John R., 4,107,349, Cl. 427-36.000.
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Kirkland, James L., 4,107,607, Cl. 324-253.000.
Moden, James R.; and Perkons, George, 4,107,406, Cl. 429-218.000.
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Piehl, Otto W., deceased, 4,106,206, Cl. 33-199.00R.
Saunders, Raymond A., 4,106,910, Cl. 23-232.00R.
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York, Floyd L., 4,106,504, Cl. 128-204.000.
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Auphan, Michel Joseph, 4,106,348, Cl. 73-624.000.
Beale, Julian R. A., 4,107,776, Cl. 364-431.000.
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Waddington, Damer Evelyn O'Neill, to Marconi Instruments Ltd. Control devices. 4,107,585, Cl. 318-331.000.

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Wagner, Howard R.: *See*—
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Wakumoto, Hiroshi: *See*—
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Waldvogel, Erwin, to Sandoz Ltd. Process for making pleuromutilins. 4,107,434, Cl. 544-59.000.

Walitalo, Charles Richard, to Union Carbide Corporation. Bag dispenser and holder. 4,106,733, Cl. 248-100.000.

Walitalo, Charles Richard, to Union Carbide Corporation. Bag dispenser and holder. 4,106,734, Cl. 248-100.000.

Walker, David Judson: *See*—
Fulmer, John Arthur; and Walker, David Judson, 4,106,890, Cl. 431-184.000.

Walker, Jerry A.; White, David R.; and Salmond, William G., to Upjohn Company, The. Process for preparing arylalkanoic acid derivatives. 4,107,439, Cl. 560-55.000.

Walker, Loren H.: *See*—
Anderson, Thomas E.; Ibsen, Ole N.; and Walker, Loren H., 4,107,771, Cl. 363-58.000.

Walkowiak, Michael: *See*—
Schrock, Wilfried; Konig, Hans-Bodo; Preiss, Michael; Metzger, Karl Georg; and Walkowiak, Michael, 4,107,304, Cl. 424-246.000.

Wallace, James L., to Monsanto Company. Mixer apparatus for continuously coagulating an aqueous latex and consolidating as a paste coagulum. 4,107,793, Cl. 366-312.000.

Walley, Gerald David, to British Aircraft Corporation. Aircraft weapon mountings. 4,106,389, Cl. 89-1.815.

Wallis, Frank: *See*—
Smith, Brian Roger; Jarvis, Charles Richard; Payne, Stephen Martin; Potts, Robert John; and Wallis, Frank, 4,106,187, Cl. 29-625.000.

Walter, Arthur, to Erwin Sick Gesellschaft mit beschrankter Haftung Optik-Elektronik. Rotary beam light curtain. 4,107,522, Cl. 250-221.000.

Walter, Jurgen, to Vulkan Kupplungs -und Getriebebau Bernhard Hackforth. Arrangement for driving a working shaft by two combustion engines. 4,106,603, Cl. 192-85.0AB.

Wandel, Stephan H. A., to EWG Import-und Export-Gesellschaft mit beschrankter Haftung. Grilling device with warming chamber. 4,106,473, Cl. 126-25.00R.

Wang, Victor Kai-Kuo, to Du Pont de Nemours, E. I., and Company. Process for making HCN. 4,107,278, Cl. 423-376.000.

Ward, Andrew H.: *See*—
Saam, John C.; and Ward, Andrew H., 4,107,227, Cl. 260-827.000.

Ward, Ernest M., to United States of America, Army. Variable pulse distribution electro-optical system. 4,107,666, Cl. 340-331.000.

Ward, John Joseph Bernard; and Barnes, Clive, to International Lead Zinc Research Organization, Inc. Trivalent chromium electroplating baths and method. 4,107,004, Cl. 204-51.000.

Ward, John W., to Union Oil Company of California. Hydrocracking process with reactivated catalyst. 4,107,031, Cl. 208-111.000.

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Warkentin, Aaron J.; and Mills, George A. Sorter for fruit and the like. 4,106,628, Cl. 209-74.00M.

Warner, Gerhardt Allan; and Warner, Kurt Ehrich. Enclosure. 4,106,520, Cl. 135-4.00R.

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Connor, David T.; Ringel, Samuel M.; and von Strandtmann, Maximilian, 4,107,429, Cl. 542-447.000.

Warren, Albert D. Sitz bath. 4,106,132, Cl. 4-6.000.

Washburn, Clayton A. Cathode ray tube indexing structures. 4,107,570, Cl. 313-471.000.

Watanabe, Hiroaki: *See*—
Kanno, Tomoei; Watanabe, Hiroaki; and Sano, Shohachiro, 4,106,987, Cl. 195-31.00F.

Watanabe, Hiroshi, to Osaka Kasei Company Limited; and Nippon Kayaku Kabushiki Kaisha. Novel aqueous insecticidal concentrate composition. 4,107,302, Cl. 424-200.000.

Watanabe, Itaru: *See*—
Koshiga, Fusao; Tanaka, Jinkichi; Watanabe, Itaru; Suzuki, Motoaki; Kojima, Toshifumi; Matsubara, Hiroyoshi; Osuka, Tatsumi; Takeshige, Kenji; Nagamine, Takashi; and Hirano, Osamu, 4,107,503, Cl. 219-61.000.

Watanabe, Katsumi, to Yugen Kaisha Watanabe Kenkyusho. Switch mechanism for simple phonograph. 4,107,489, Cl. 200-52.00R.

Watanabe, Ryuji; Sato, Syoichi; and Tomita, Sadami, to Agency of Industrial Science & Technology. Method and apparatus for use in separation and recovery of non-magnetic metal pieces. 4,106,627, Cl. 209-7.000.

Waterhouse, John Sidney: *See*—
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Watkins, Fred E.: *See*—
Gatlin, Alvin O.; Tausch, Gilbert H.; and Watkins, Fred E., 4,106,563, Cl. 166-117.500.

Watson, Charles A., Jr., to E-Systems, Inc. Phase locked detector. 4,107,684, Cl. 343-7.500.

Watson, Harry A., Jr.: *See*—
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Watson, Stanley W.: *See*—
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Watts, Eric Alfred, to Beecham Group Limited. Chroman derivatives. 4,107,317, Cl. 424-267.000.

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Weatherchem Corporation: *See*—
Tecco, Charles; and Lasich, Lawrence E., 4,106,672, Cl. 222-151.000.

Weatherhead Company, The: *See*—
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Kozulla, Robert E., 4,106,689, Cl. 233-23.00R.

Weaver, Daniel J.; Treiber, Robert; and Wolanow, Avner, to Singer Company, The. Efficient bidirectional power converter for portable data gathering apparatus. 4,107,596, Cl. 323-17.000.

Weber, Donald R., to Dacom, Inc. Data transmission system using a sequential approximation encoding and decoding technique. 4,107,610, Cl. 325-38.00R.

Weber, Frank K., to Arant, Gene W., a part interest. Modular chandelier with plug-in arms. 4,107,770, Cl. 362-405.000.

Weber, Paul: *See*—
Kessler, Erich; Hassemer, Georg; and Weber, Paul, 4,106,244, Cl. 52-63.000.

Weber, Robert J.: *See*—
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Webster, John David; and Jewell, Thomas John, to English Clay Lovering Pochin & Co. Ltd. Method of lining pipes, molds or other tubular articles with thermosetting plastic material. 4,107,254, Cl. 264-270.000.

Weckenmann, Albert: *See*—
Haas, Lothar; Brautigam, Rolf; and Weckenmann, Albert, 4,107,555, Cl. 307-308.000.

Wedemeyer, Karlfried: *See*—
Grotkopp, Detlef; Wedemeyer, Karlfried; Behrenz, Wolfgang; and Hammann, Ingeborg, 4,107,324, Cl. 424-300.000.

Wegemund, Bernd: *See*—
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Wegner, Jurgen; Bansemir, Klaus; and Ettingshausen, Othmar V., to Henkel Kommanditgesellschaft auf Aktien. Disinfectant for use in closed-circuit toilet flushing fluids. 4,107,312, Cl. 424-263.000.

Weidler, Charles Harry, to AMP Incorporated. Switch assembly for circuit boards. 4,107,499, Cl. 200-153.0LA.

Weigand, Rex Olen; McMillen, Kenneth Ray; Fulk, Ronald Dean; Prichard, Daniel Ray; and Kountz, Jack Merriel, to Hesston Corporation. Four row forage harvester. 4,106,270, Cl. 56-98.000.

Weiler, Raywood C., to Blackstone Manufacturing Co., Inc. Vehicle step. 4,106,790, Cl. 280-166.000.

Weinschel Engineering Co.: *See*—
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Weir, Niall Galbraith: *See*—
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Weis, Frank George, to Ecodyne Corporation. Method and apparatus for removing grit. 4,107,038, Cl. 210-84.000.

Weis, Rudolf R.: *See—*
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Weise, Lutz: *See—*
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Weisgerber, Charles E., to Raygo Wagner, Inc. Load handling vehicle. 4,106,646, Cl. 214-147.00R.

Weiss, C. David: *See—*
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Weiss, Martin Joseph: *See—*
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Weiss, Richard. Method of and an arrangement for establishing an underground passage. 4,106,297, Cl. 61-42.000.

Welch, M. Bruce, to Phillips Petroleum Company. Olefin polymerization process and catalyst therefor. 4,107,412, Cl. 526-114.000.

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Wenzel, Werner; Gudenau, Heinrich; and Bernt, Joachim, to Wenzel, Werner; and Gudenau, Heinrich Wilhelm. Method of improving the mechanical resistance of coke. 4,106,996, Cl. 201-6.000.

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Franz, Reinhard, 4,106,388, Cl. 84-434.000.

Wertz, Daniel Elanzo. Boat and steering apparatus therefor. 4,106,426, Cl. 115-70.000.

West, Curtis W.; Lee, Larry E.; and Norris, Aubrey O. Vehicle utilizing cryogenic fuel. 4,106,581, Cl. 180-54.00B.

West, Gene A., to General Motors Corporation. Engine spark timing system with retard means and minimum burn timer. 4,106,447, Cl. 123-117.00R.

Westerman, Richard V.: *See—*
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Western Electric Company, Inc.: *See—*
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Hart, James E., 4,106,819, Cl. 303-38.000.

Westinghouse Brake and Signal Company Limited: *See—*
Tregoning, Geoffrey Robinson, 4,106,876, Cl. 403-4.000.

Westinghouse Canada Limited: *See—*
Hakim, Mohammad Javid, 4,107,352, Cl. 427-50.000.

Westinghouse Electric Corp.: *See—*
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Golota, John H., 4,107,498, Cl. 200-148.00B.
Guidosh, Edward F., 4,107,637, Cl. 336-150.000.
Harvey, Francis J., II; and Fey, Maurice G., 4,106,928, Cl. 75-68.00B.
Heiser, Richard S., 4,107,542, Cl. 290-40.00R.
Kirsch, Andrew F.; and Koob, Robert W., 4,106,594, Cl. 187-29.00R.
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Mendelsohn, Morris A.; Rosenblatt, Girard B., Jr.; and Meier, Joseph F., 4,107,107, Cl. 521-106.000.
Meuschke, Robert E.; and Martinez, Jose M., 4,106,983, Cl. 176-19.00R.
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Repik, Albert J.; Miller, Charles E.; and Johnson, Homer R., 4,107,084, Cl. 252-445.000.

WF "Rational" Anbaukuchen Walter Fischerriemsloh: *See—*
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Wheeler, Roland T. Motor. 4,106,391, Cl. 91-481.000.

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White, Allen A.; Case, Cecil L.; Ankenman, Thomas W.; and Yatcilla, George, to Hesston Corporation. Method for loading and baling crop material. 4,106,268, Cl. 56-1.000.

White, Allen Andrew, to Hesston Corporation. Baler loading method and apparatus. 4,106,267, Cl. 56-1.000.

White, David R.: *See—*
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Whiting, Ernest Henry. Camper trailer. 4,106,732, Cl. 296-23.00C.

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Whittington, Billy J.; Robinson, John William; and Dietrich, Ralph N., to Kimball International, Inc. Variable filter circuit, especially for synthesizing and shaping tone signals. 4,106,384, Cl. 84-1.190.

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Wiezer, Hartmut: *See—*
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Wilansky, Harold, to Hilliard Corporation, The. Filter cartridge. 4,107,050, Cl. 210-492.000.

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Wilding, David C. M.: *See—*
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Willard, Donald A.: *See—*
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Williams, Derek Geoffrey, to Massey-Ferguson Services N.V. Clamping devices. 4,106,644, Cl. 214-138.00C.

Williams, Frank J., III; and Donahue, Paul E., to General Electric Company. Polysulfoneimides. 4,107,147, Cl. 528-172.000.

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Willis, Philip John: *See—*
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Willson, Michael C.: *See—*
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Wilson, Jeffrey V.; Tucker, Leroy W.; Briggs, William D.; and Inouye, Alan T., to United States of America, Navy. Quick disconnect intercell busbar for deep submergence batteries. 4,106,833, Cl. 339-29.00B.

Wilson, Paul Alan: *See—*
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Wilson, Porter C., to Laurence, Margaret M. Resuscitator. 4,106,502, Cl. 128-145.800.

Wilson, Richard A.; Mookherjee, Braja Dulal; Hruza, Anne Sanderson; Vock, Manfred Hugo; Frederick, Louis Schmitt; and Vinals, Joaquin Francisco, to International Flavors & Fragrances Inc. 1-[3-(Methylthio)butyryl]-2,6,6-trimethyl-cyclohexene and the 1,3-cyclohexadiene analog. 4,107,209, Cl. 260-586.00R.

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Winchell, Frank J., to General Motors Corporation. Centrifugal and one way clutches in series with friction clutch. 4,106,605, Cl. 192-105.0CD.

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Yamashita, Ryuichi; Matsumoto, Hiromitsu; and Eda, Masato, to Yamaha Hatsudoki Kabushiki Kaisha. Programmed control system for a lean-burning internal combustion engine. 4,106,464, Cl. 123-179.00A.
Yamashita, Shiro, to Kabushiki Kaisha Daini Seikosha. Combination portable electronic timepiece and television. 4,106,283, Cl. 58-152.00R.
Yamashita, Yoshio: *See*—
Nakayama, Yasuharu; Hirata, Nobuhito; and Yamashita, Yoshio, 4,107,114, Cl. 260-22.0CB.
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Kijima, Shizumasa; Igarashi, Toshiji; Yamatsu, Isao; Hamamura, Kimio; Nakajima, Yoshikage; Minami, Norio; Yamagishi, Youji; and Inai, Yuithi, 4,107,193, Cl. 260-410.000.
Yamauchi, Nobuharu: *See*—
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Yamazaki, Yoichi: *See*—
Nii, Yoshiji; Matsuda, Takayuki; Yamazaki, Yoichi; and Nohara, Haruo, 4,107,778, Cl. 364-492.000.
Yanagimoto, Samon; Kawaharada, Minoru; Nagata, Shuji; and Koyama, Fujimasa, to Nippon Steel Corporation. Method and apparatus for rolling metallic material. 4,106,318, Cl. 72-199.000.
Yano, Kanji: *See*—
Ban, Itsuki; Nozaki, Sumio; Kasuya, Takanori; Shinkado, Yukio; and Yano, Kanji, 4,107,750, Cl. 360-106.000.
Yano, Yasuhiro: *See*—
Kobayashi, Hajime; Yano, Yasuhiro; and Endo, Ichiro, 4,106,409, Cl. 101-426.000.
Yao, Ying Luh, to International Business Machines Corporation. Data bus arrangement for Josephson tunneling device logic interconnections. 4,107,554, Cl. 307-306.000.
Yasuda, Hirofumi, to Kabushiki Kaisha Suwa Seikosha. Electronic timepiece utilizing semiconductor-insulating substrate integrated circuitry. 4,106,278, Cl. 58-23.00A.
Yasuhara, Buhei: *See*—
Morimoto, Katsuhide; Matsumura, Masaji; Yamauchi, Nobuharu; Koyanagi, Haruo; Sato, Iwao; Yasuhara, Buhei; and Sakai, Jiro, 4,107,663, Cl. 340-324.0AD.
Yasui, Sadahiko: *See*—
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Yasui Sangyo Co., Ltd.: *See*—
Nishimura, Matsuo, 4,106,635, Cl. 214-8.50A.
Yasuike, Akio; Kataoka, Hiroshi; Fujikawa, Tutomu; and Suzuki, Naoto, to Asahi-Dow Limited. Apparatus for injection molding synthetic resin materials. 4,106,887, Cl. 425-549.000.
Yatcilla, George: *See*—
White, Allen A.; Case, Cecil L.; Ankenman, Thomas W.; and Yatcilla, George, 4,106,268, Cl. 56-1.000.
Yatsu, Tadao; and Wakumoto, Hiroshi, to Mitsui Petrochemical Industries Ltd. Process for preparing copolymers. 4,107,418, Cl. 526-184.000.
Yealy, Carl F.; and Abbott, Joseph, to Penland Container, Inc. Method of making an all plastic caulking cartridge. 4,106,963, Cl. 156-73.500.
Yin, Ching-Feng: *See*—
Heyn, Fred M.; Yin, Ching-Feng; Hanson, Gordon L.; and Schreck, Robert C., 4,106,556, Cl. 165-81.000.
Yokoi, Yasuaki: *See*—
Sakai, Akira; Inui, Taiji; and Yokoi, Yasuaki, 4,106,286, Cl. 60-39.18B.
Yokouchi, Haruo: *See*—
Furutani, Nagahisa; Takahara, Kazuo; Doi, Yoshikazu; and Yokouchi, Haruo, 4,107,621, Cl. 330-296.000.
Yonan, Peter K.: *See*—
Renbarger, Jerry J.; and Yonan, Peter K., 4,107,205, Cl. 260-558.00A.
York, Floyd L., to United States of America, Navy. Portable recompression chamber with air scrubber. 4,106,504, Cl. 128-204.000.
Yorker Research Corporation: *See*—
Lin, A. Oscar, 4,106,698, Cl. 239-34.000.
Yoshida, Makoto: *See*—
Asakawa, Kenichi; and Yoshida, Makoto, 4,107,357, Cl. 427-300.000.
Yoshida, Takashi; and Matsuyama, Takeshi, to Nippon Gakki Seizo Kabushiki Kaisha. Compound field effect transistor. 4,107,725, Cl. 357-41.000.
Yoshikawa, Kazuo: *See*—
Kawada, Toyoshi; Andoh, Shizuo; and Yoshikawa, Kazuo, 4,107,578, Cl. 315-169.0TV.
Yoshimura, Tooru: *See*—
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Yoshino, Muneki, to Nippondenso Co., Ltd. Deceleration indicating system. 4,107,647, Cl. 340-71.000.
Yoshino, Tsuneo; and Tatsuma, Junji, to Caterpillar Mitsubishi Ltd. Fuel tank water separator assembly. 4,107,052, Cl. 210-534.000.
Yoshizaki, Akira: *See*—
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Young Industries, Inc., The: *See*—
Foresman, James Daniel, 4,107,035, Cl. 209-309.000.

Young, Jerry W.: *See*—
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Young, Lawrence Henry: *See*—
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Young, Rodney Christopher: *See*—
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Youtsey, Karl J.: *See*—
Carnahan, Robert D.; Holt, William C., Jr.; and Youtsey, Karl J., 4,107,092, Cl. 252-511.000.
Yuasa, Yoshio; Morizumi, Yosihiro; and Orui, Ryuzo, to Nippon Electric Co., Ltd. Traveling-wave tube having phase velocity tapering means in a slow-wave circuit. 4,107,572, Cl. 315-3.600.
Yugen Kaisha Watanabe Kenkyusho: *See*—
Watanabe, Katsumi, 4,107,489, Cl. 200-52.00R.
Zabcik, Clarence John, to Nl Hycalog. Automatic sequential dual action sealing system. 4,106,779, Cl. 277-27.000.
Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: *See*—
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Zapara, Gerald A., to National Storage Systems, Inc. Demountable modular display system for furniture and the like. 4,106,248, Cl. 52-234.000.
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Zbornik, Vaclav: *See*—
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Zechinati, James; and Pegg, Elra W., to Standard Oil Company (Indiana). Process for making fiber-reinforced thermoplastic pellets. 4,107,250, Cl. 264-118.000.
Zelinski, Robert P.: *See*—
Naylor, Floyd E.; and Zelinski, Robert P., 4,107,236, Cl. 260-879.000.
Zenitani, Toshio, to International Med-Electronics, Inc.; and Heiwa Electronic Industrial Co. Cassette for portable X-ray camera. 4,107,538, Cl. 250-480.000.
Zenith Radio Corporation: *See*—
Jones, Gary A., 4,107,730, Cl. 358-37.000.
Zenker, Walter; and Hulsebusch, Karl-Heinz, to Klockner-Humboldt-Deutz Aktiengesellschaft. Variable gear transmission. 4,106,364, Cl. 74-740.000.
Ziegler, Bodo: *See*—
Bernhardt, Walter; and Ziegler, Bodo, 4,106,465, Cl. 123-179.00H.
Ziemelis, Maris J.: *See*—
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Zimmer Aktiengesellschaft: *See*—
Dicoi, Ovidiu; and Doerr, Erwin, 4,107,160, Cl. 260-239.30A.
Zimmer, Karl Joseph, to Burroughs Corporation. Dual printed circuit card mount assembly. 4,107,760, Cl. 361-383.000.
Zimmerman, Walter R.: *See*—
Seifert, Peter; and Zimmerman, Walter R., 4,106,980, Cl. 162-330.000.
Zimnukhov, Viktor Alexandrovich: *See*—
Moiseev, Vladimir Vasilievich; Kosovtsev, Vladimir Vasilievich; Kolesnikova, Galina Prokofievna; Esina, Tamara Ivanovna; Polukhin, Alexandr Nikolaevich; and Zimnukhov, Viktor Alexandrovich, 4,107,141, Cl. 528-129.000.
Zinoviev, Alexandr Mikhailovich: *See*—
Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pirogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Borisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; Shevtsov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich; Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mateshin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich; Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich; Koen, David Matveevich; Seleverstov, Vladimir Vasilievich; Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pizogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Bozisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zakharovich, 4,107,449, Cl. 13-35.000.
Zirinsky, Stanley: *See*—
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Zmuidzinas, Jonas S.: *See*—
United States of America, National Aeronautics and Space Administration; and Zmuidzinas, Jonas S., 4,107,627, Cl. 331-94.5PE.
Zurbrigg, Charles Edward; and Keenan, William Douglas Sulman, to Lac-Mac Limited. Reversible surgical gown. 4,106,120, Cl. 2-51.000.
Zutaut, Chesly L.: *See*—
Brower, Loyd R., Jr.; Madsen, Leonard P.; Zutaut, Chesly L.; and Barden, Walter M., Jr., 4,107,016, Cl. 204-181.00R.
Zwirn, Robert, to United States of America, Air Force. Gate tracking technique utilizing dimension memory. 4,107,677, Cl. 343-7.00A.
Zyliss Zysset AG: *See*—
Ackeret, Peter, 4,106,401, Cl. 99-508.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 15TH DAY OF AUGUST, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Abbott Laboratories: *See—*
Flouret, George Rogelio, Re. 29,732, Cl. 260-112.50R.

Benmax, Peter David. Buttoning means. Re. 29,729, Cl. 24-90.00B.

Darwood, James R., to T.A.D. Avanti, Inc. Telephone answering apparatus. Re. 29,733, Cl. 179-6.00R.

Fishman, Herbert; and Kresge, James S., to General Electric Company. Metal oxide voltage-variable resistor composition. Re. 29,731, Cl. 252-521.000.

Flouret, George Rogelio, to Abbott Laboratories. Tripeptide. Re. 29,732, Cl. 260-112.50R.

Franklin, Robert S. Lifesaving device. Re. 29,728, Cl. 9-14.000.

General Electric Company: *See—*
Fishman, Herbert; and Kresge, James S., Re. 29,731, Cl. 252-521.000.

Kresge, James S.: *See—*
Fishman, Herbert; and Kresge, James S., Re. 29,731, Cl. 252-521.000.

Manning, Kenneth G., to Schlumberger Technology Corporation. Well bore data-transmission apparatus with debris clearing apparatus. Re. 29,734, Cl. 340-18.0NC.

Matsushita Electric Industrial Co., Ltd.: *See—*
Miyoshi, Seizo, Re. 29,730, Cl. 274-10.00R.

Miyoshi, Seizo, to Matsushita Electric Industrial Co., Ltd. Automatic record player. Re. 29,730, Cl. 274-10.00R.

Murray Tovi Designs, Inc.: *See—*
Tovi, Murray, Re. 29,735, Cl. 362-401.000.

Schlumberger Technology Corporation: *See—*
Manning, Kenneth G., Re. 29,734, Cl. 340-18.0NC.

T.A.D. Avanti, Inc.: *See—*
Darwood, James R., Re. 29,733, Cl. 179-6.00R.

Tovi, Murray, to Murray Tovi Designs, Inc. Rotational lighting system. Re. 29,735, Cl. 362-401.000.

LIST OF PLANT PATENTEES

F. Harmon Saville Nor'East Miniature Roses: *See—*
Schwartz, Ernest, deceased, 4,291, Cl. 7.000.
Schwartz, Ernest, deceased, 4,292, Cl. 7.000.
Schwartz, Ernest, deceased, 4,293, Cl. 10.000.
Schwartz, Ernest, deceased, 4,294, Cl. 9.000.

Schwartz, Ernest, deceased (by Schwartz, Hazel E., executrix), to F. Harmon Saville Nor'East Miniature Roses. Rose plant. 4,291, 8-15-78, Cl. 7.000.

Schwartz, Ernest, deceased (by Schwartz, Hazel E., executrix), to F. Harmon Saville Nor'East Miniature Roses. Rose plant. 4,292, 8-15-78, Cl. 7.000.

Schwartz, Ernest, deceased (by Schwartz, Hazel E., executrix), to F. Harmon Saville Nor'East Miniature Roses. Rose plant. 4,293, 8-15-78, Cl. 10.000.

Schwartz, Ernest, deceased (by Schwartz, Hazel E., executrix), to F. Harmon Saville Nor'East Miniature Roses. Rose plant. 4,294, 8-15-78, Cl. 9.000.

Schwartz, Hazel E., executrix: *See—*
Schwartz, Ernest, deceased, 4,291, Cl. 7.000.
Schwartz, Ernest, deceased, 4,292, Cl. 7.000.
Schwartz, Ernest, deceased, 4,293, Cl. 10.000.
Schwartz, Ernest, deceased, 4,294, Cl. 9.000.

LIST OF DESIGN PATENTEES

AB Bofors: *See—*
Carlsson, Karl Ingvar; and Akesson, Sven Torsten, 248,941, Cl. D12-183.000.

Aho, Olli; Hartman, Timo; Hyytianien, Jouko; Kaarnametsa, Matti; Moisander, Jukko; Makela, Markku; and Rikkonen, Kari, to Rauma-Repola Oy. Tree harvester. 248,953, 8-15-78, Cl. D15-26.000.

Akesson, Sven Torsten: *See—*
Carlsson, Karl Ingvar; and Akesson, Sven Torsten, 248,941, Cl. D12-183.000.

Alger, Andrew L., to Computer Peripherals, Inc. Printer housing or similar article. 248,949, 8-15-78, Cl. D14-50.000.

American Cyanamid Company: *See—*
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Anderson, Charles F.: *See—*
Canfield, Vernon C.; and Anderson, Charles F., 248,912, Cl. D6-157.000.

Anderson, Dennis C.: *See—*
Stutelberg, Kenneth R.; and Anderson, Dennis C., 248,935, Cl. D11-155.000.

APF Electronics, Inc.: *See—*
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Arfert, Horst F. W.: *See—*
Reynolds, William G.; and Arfert, Horst F. W., 248,916, Cl. D7-15.000.

Arrowhead Enterprises, Inc.: *See—*
Kahl, William G., Jr., 248,930, Cl. D10-106.000.

Astleford, Thomas R.; and Stout, James E. Illuminated microphone holder. 248,945, 8-15-78, Cl. D14-13.000.

Atari, Inc. (Delaware Corporation): *See—*
Cook, David M., 248,982, Cl. D34-5.00L.

Atherton, John: *See—*
Firth, Angus Christopher; Sheldon, Frederick John; Atherton, John; and Block, William John, 248,938, Cl. D12-129.000.

Ball Corporation: *See—*
Campbell, William B., 248,934, Cl. D11-121.000.

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Bell & Howell Company: *See—*
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Benkoe, Elisabeth, executrix: *See—*
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Benkoe, Erwin, deceased: *See—*
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BFG Baumgartner Freres SA: *See—*
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Block, William John: *See—*
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Brandenfels, Carl, to H. T. Products, Inc. Baker's table or similar article. 248,915, 8-15-78, Cl. D6-179.000.

Campbell, William B., to Ball Corporation. Christmas ornament. 248,934, 8-15-78, Cl. D11-121.000.

Canfield, Vernon C.; and Anderson, Charles F., to Pacific National Bank of Washington. Multiple position service counter unit. 248,912, 8-15-78, Cl. D6-157.000.

Canon Kabushiki Kaisha: *See*—
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Carlsson, Karl Ingvar; and Akesson, Sven Torsten, to AB Bofors. Vehicle window frame. 248,941, 8-15-78, Cl. D12-183.000.

Cartabiano, Michael C., to Child Guidance Playthings, Inc. Toy amusement center. 248,989, 8-15-78, Cl. D34-15.00R.

Carter, Earl C. Wrist ash tray. 248,972, 8-15-78, Cl. D27-14.000.

Cassia, Antonio Macchi, to Steiner American Corporation. Bottle. 248,927, 8-15-78, Cl. D9-158.000.

Cavicchi, Eugene Alfred; and Scigliano, George. Sailing game board. 248,983, 8-15-78, Cl. D34-5.0SS.

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Child Guidance Playthings, Inc.: *See*—
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Cole, David M., to Tread Corporation. Vertical security chest. 248,975, 8-15-78, Cl. D31-22.000.

Comalco Products Pty. Limited: *See*—
Curtis, Christopher John, 248,924, Cl. D8-394.000.

Computer Peripherals, Inc.: *See*—
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Connolly, Jackson, to Watt Watchers, Inc. Watt meter housing. 248,929, 8-15-78, Cl. D10-102.000.

Cook, David M., to Atari, Inc. (Delaware Corporation). Game cabinet. 248,982, 8-15-78, Cl. D34-5.00L.

Cooper Industries, Inc.: *See*—
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De brey, Robert J., to Minnesota Mining and Manufacturing Company. Pressure sensitive adhesive tape dispenser. 248,961, 8-15-78, Cl. D19-69.000.

DeFilippo, Francis. Hanger for potted plants. 248,910, 8-15-78, Cl. D6-137.000.

DeLeone, Carmen D.; West, Ruth; and DiStefano, Anthony, to Engine Specialties, Inc. Glove. 248,898, 8-15-78, Cl. D2-361.000.

de Neufville, Axel. Document belt. 248,899, 8-15-78, Cl. D2-383.000.

Der-Avanessian, Mesrop. Dust catcher for grinding operations or the like. 248,954, 8-15-78, Cl. D15-126.000.

DiStefano, Anthony: *See*—
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Effinger, William L.: *See*—
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Engine Specialties, Inc.: *See*—
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Eriksson, Goran, to Masonite AB. Anti-skid bar for power driven vehicles. 248,939, 8-15-78, Cl. D12-154.000.

Ettress, Ollie H. Combined support for light source and table for potted plants or the like. 248,914, 8-15-78, Cl. D6-175.000.

Everitt, Delmar K.: *See*—
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Ferguson, William C., to Cooper Industries, Inc. Scissors. 248,921, 8-15-78, Cl. D8-57.000.

Figueroa, Henry D. Cart for transporting collapsible tables. 248,937, 8-15-78, Cl. D12-26.000.

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Firth, Angus Christopher; Sheldon, Frederick John; Atherton, John; and Block, William John, to Lawrence Wilson & Son Limited. Collapsible baby carriage. 248,938, 8-15-78, Cl. D12-129.000.

Fogleman, H. Frank, to Gremlin Industries, Inc. Electronic game panel of soccer or the like. 248,977, 8-15-78, Cl. D34-5.0SS.

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Frierdich, Richard D.: *See*—
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Furlong, Thomas A.; and Goldstein, Charles D., to American Cyanamid Company. Bottle or similar article. 248,926, 8-15-78, Cl. D9-143.000.

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Glaubinger, Martin; and Effinger, William L., to Rolodex Corporation. File card holder. 248,962, 8-15-78, Cl. D19-76.000.

Godfrey, Nelson Frederick. Electrical switch. 248,944, 8-15-78, Cl. D13-32.000.

Goldfarb, Adolph E.; Benkoe, Erwin, deceased; Benkoe, Elisabeth, executrix; Everitt, Delmar K.; Chesley, Ronald F.; and Frierdich, Richard D., to Goldfarb, Adolph E.; and Benkoe, Elisabeth, executrix for the estate of Erwin Benkoe. Launcher for toy aircraft. 248,988, 8-15-78, Cl. D34-15.0PP.

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Graham, William G., to Las Vegas Convention Service Co. Video production module. 248,947, 8-15-78, Cl. D14-42.000.

Greenleaf, Lloyd: *See*—
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Grunstad, Jerome A., to Minnesota Mining and Manufacturing Company. Magnetic weighing scale. 248,928, 8-15-78, Cl. D10-91.000.

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Handel, David M., to Bennington Company, The. Combination dresser and mirrored hutch. 248,911, 8-15-78, Cl. D6-154.000.

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Hasday, Robert Steven; Lodico, Carmen; and Greenleaf, Lloyd. Jacket. 248,896, 8-15-78, Cl. D2-184.000.

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Hodge, Joseph. Aspirator tube. 248,969, 8-15-78, Cl. D24-54.000.

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Ito, Shima, to Matsushita Electric Works, Ltd. Detachable electric shaver head. 248,973, 8-15-78, Cl. D28-49.000.

Iverson, Yvonne J. Key label. 248,960, 8-15-78, Cl. D19-18.000.

Jalk, Grete; and Gammelgard, Jorgen, to Swingline, Inc. Stapler. 248,920, 8-15-78, Cl. D8-50.000.

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Nakamura, Kenji, to L C Chemical Company Limited. Dial for clock. 248,932, 8-15-78, Cl. D10-125.000.
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835	4,106,382

CLASS 84

1.01	4,106,383
1.19	4,106,384
1.24	4,106,385
256	4,106,386
312 P	4,106,387
434	4,106,388

CLASS 89

1.815	4,106,389

CLASS 91

42	4,106,390
481	4,106,391

CLASS 92

128	4,106,392
168	4,106,393

CLASS 93

1 F	4,106,394
35 R	4,106,395
36.5 R	4,106,396
55.1 R	4,106,397
84 TW	4,106,398

CLASS 96

1.5 R	4,106,933
	4,106,934
	4,106,935
27 R	4,106,936
36.1	4,106,937
48 HD	4,106,938
48 R	4,106,939
74	4,106,940
82	4,106,941
100 N	4,106,942
115 R	4,106,943

CLASS 98

2.14	4,106,399

CLASS 99

373	4,106,400
508	4,106,401
571	4,106,402

CLASS 100

25	4,106,403
117	4,106,404
162 B	4,106,405

CLASS 101

93.31	4,106,406
120	4,106,407
401.1	4,106,408
426	4,106,409

CLASS 102

67	4,106,410
	4,106,411

CLASS 105

197 DH	4,106,412

CLASS 106

38.2	4,106,944
38.3	4,106,945
52	4,106,946
57	4,106,947
197 R	4,106,948
288 B	4,106,949

CLASS 108

12	4,106,413

CLASS 111

1	4,106,414
3	4,106,415

CLASS 112

79 A	4,106,416
119	4,106,417
158 A	4,106,419
158 B	4,106,418

CLASS 113

12	4,106,420
120 A	4,106,421
121 C	4,106,422

CLASS 114

74 A	4,106,423
	4,106,424

CLASS 115

42	4,106,425
70	4,106,426

CLASS 116

90	4,106,427
114 P	4,106,428

CLASS 118

63	4,106,429
64	4,106,430
203	4,106,431
211	4,106,432
212	4,106,433
258	4,106,434
301	4,106,435
307	4,106,436
412	4,106,437

CLASS 119

1	4,106,438

CLASS 123

18 R	4,106,441
26	4,106,442
41.82 R	4,106,444
43 R	4,106,443
53 A	4,106,445
75 B	4,106,439
90.13	4,106,446
117 R	4,106,440
	4,106,447
119 A	4,106,449
	4,106,452
119 E	4,106,456
119 EC	4,106,450
	4,106,451
119 LR	4,106,448
120	4,106,453
122 E	4,106,455
122 F	4,106,454
133	4,106,457
139 AT	4,106,458
141	4,106,459

146.5 D 4,106,460
148 E 4,106,461
4,106,462
179 A 4,106,464
179 H 4,106,465
188 S 4,106,466
191 SP 4,106,467
193 P 4,106,463
196 S 4,106,468
198 DB 4,106,469
4,106,470
198 F 4,106,471
205 4,106,472

CLASS 126

25 R 4,106,473
110 R 4,106,474
121 4,106,475
140 4,106,476
263 4,106,477
4,106,478
270 4,106,479
4,106,480
271 4,106,481
4,106,482
4,106,483
4,106,484
4,106,485
369 4,106,486

CLASS 127

23 4,106,487

CLASS 128

1 R 4,106,488
4,106,489
2 F 4,106,490
4,106,491
4,106,497
2 R 4,106,493
4,106,496
2 V 4,106,492
2.05 A 4,106,498
2.05 C 4,106,499
2.06 B 4,106,494
2.06 V 4,106,495
36 4,106,500
62 A 4,106,501
145.8 4,106,502
194 4,106,503
204 4,106,504
206 4,106,505
214.4 4,106,506
295 4,106,507
346 4,106,508
349 B 4,106,509
350 V 4,106,510
407 4,106,511
418 4,106,512
420 R 4,106,513
519 4,106,514

CLASS 132

45 R 4,106,515

CLASS 134

10 4,106,950
45 4,106,516
58 D 4,106,517
104 4,106,518
122 R 4,106,519

CLASS 135

4 R 4,106,520
67 4,106,521

CLASS 136

89 HY 4,106,952
89 NB 4,106,951

CLASS 137

512 4,106,522
614.04 4,106,523
625.44 4,106,524

CLASS 138

43 4,106,525
109 4,106,526
131 4,106,527
149 4,106,528

CLASS 139

92 4,106,529
4,106,530
383 B 4,106,531

CLASS 140

147 4,106,532

CLASS 141

1 4,106,533
18 4,106,534
88 4,106,535
220 4,106,536

CLASS 144

34 R 4,106,537
309 R 4,106,538

CLASS 145

2 A 4,106,539

CLASS 148

1.5 4,106,953
4,106,954
6 4,106,955
11.5 A 4,106,956
12 B 4,106,957
23 4,106,958
175 4,106,959

CLASS 149

11 4,106,960

CLASS 151

14 CS 4,106,540
48 4,106,541

CLASS 152

239 4,106,542
405 4,106,543

CLASS 156

48 4,106,961
73.1 4,106,962
73.5 4,106,963
75 4,106,964
123 R 4,106,965
138 4,106,966
184 4,106,967
189 4,106,968
275 4,106,969
306 4,106,970
310 4,106,971
363 4,106,972
433 4,106,973
504 4,106,974
628 4,106,975
644 4,106,976
645 4,106,977

CLASS 160

199 4,106,544

CLASS 162

1 4,106,978
73 4,106,979
330 4,106,980
352 4,106,981

CLASS 164

18 4,106,545
49 4,106,546
82 4,106,547
132 4,106,548
263 4,106,549
448 4,106,550
4,106,551

CLASS 165

2 4,106,552
9 4,106,553
32 4,106,554
45 4,106,555
81 4,106,556
105 4,106,557
109 4,106,558
111 4,106,559
159 4,106,560

CLASS 166

55.2 4,106,561
97 4,106,562
117.5 4,106,563
4,106,564
118 4,106,565

CLASS 169

44 4,106,566

CLASS 172

59 4,106,567
327 4,106,568

CLASS 173

1 4,106,569
12 4,106,570
64 4,106,571
93 4,106,572
106 4,106,573

CLASS 174

84 R 4,107,451
84 S 4,107,452
87 4,107,453
135 4,107,454
140 R 4,107,455
151 4,107,456

CLASS 175

4.57 4,106,574
170 4,106,575
313 4,106,576
340 4,106,577
407 4,106,578

CLASS 176

11 4,106,982
19 R 4,106,983
32 4,106,984
68 4,106,985

CLASS 177

137 4,106,579
205 4,106,580

CLASS 178

17.5 4,107,457
22 4,107,458
69.1 4,107,459

CLASS 179

1 B 4,107,464
1 G 4,107,463
1 GA 4,107,461
1 N 4,107,465
1 SD 4,107,460
1 VC 4,107,462
2 A 4,107,466
2 DP 4,107,467
6 R Re.29,733
15 AT 4,107,480
15 BW 4,107,469
15 BY 4,107,468
15 FD 4,107,471
15 FS 4,107,470
18 BF 4,107,473
18 GF 4,107,472
4,107,474
84 T 4,107,476
4,107,495
84 VF 4,107,475
99 4,107,477
100.4 ST 4,107,478
116 4,107,479
164 4,107,481

CLASS 180

54 B 4,106,581
64 A 4,106,582
65 E 4,106,583
105 E 4,106,584

CLASS 181

107 4,106,585
121 4,106,586
213 4,106,587
284 4,106,588

CLASS 182

5 4,106,589
20 4,106,590
93 4,106,591

CLASS 184

25 4,106,592

CLASS 187

29 R 4,106,593
4,106,594

CLASS 188

73.3 4,106,595
314 4,106,596

CLASS 190

42 4,106,597
52 4,106,598

CLASS 191

27 4,106,599
59.1 4,106,600

CLASS 192

0.098 4,106,604
3 S 4,106,601
45 4,106,602
85 AB 4,106,603
105 CD 4,106,605
113 B 4,106,606
129 B 4,106,607

CLASS 194

1 B 4,106,609
1 R 4,106,608
97 R 4,106,610

CLASS 195

28 R 4,106,986
31 F 4,106,987
49 4,106,988
62 4,106,989
63 4,106,990
4,106,991
65 4,106,993
66 B 4,106,992
80 R 4,106,994
103.5 R 4,106,995

CLASS 198

479 4,106,612
847 4,106,613

CLASS 200

6 B 4,107,482
35 R 4,107,483
42 T 4,107,484
43 4,107,485
48 KB 4,107,487
48 R 4,107,486
50 A 4,107,488
52 R 4,107,489
4,107,490
61.42 4,107,491
81.9 M 4,107,492
84 C 4,107,493
4,107,494
144 B 4,107,496
144 R 4,107,497
148 B 4,107,498
153 LA 4,107,499
308 4,107,500

CLASS 201

6 4,106,996
32 4,106,997
39 4,106,998

CLASS 202

118 4,106,999
188 4,107,000
241 4,107,001

CLASS 203

75 4,107,002

CLASS 204

16 4,107,003
51 4,107,004
98 4,107,005
105 M 4,107,006
116 4,107,007
129 4,107,008
4,107,009
4,107,010
151 4,107,011
159.16 4,107,013
159.19 4,107,012
180 P 4,107,015
180 R 4,107,014
181 R 4,107,016
195 R 4,107,017
195 S 4,107,018
4,107,019
251 4,107,020
263 4,107,021
265 4,107,022
269 4,107,023
275 4,107,024
290 F 4,107,025
300 R 4,107,026
301 4,107,027

CLASS 206

45.14 4,106,614
45.31 4,106,615
233 4,106,616
4,106,617
343 4,106,618
346 4,106,619
363 4,106,620
365 4,106,621
4,106,622
506 4,106,623
507 4,106,624
4,106,625
513 4,106,626

CLASS 208

11 LE 4,107,029
48 AA 4,107,030
111 4,107,031
120 4,107,032

CLASS 209

5 4,107,028
7 4,106,627
17 4,107,033
74 M 4,106,628
135 4,107,034
309 4,107,035

CLASS 210

21 4,107,036
82 4,107,037
84 4,107,038
90 4,107,039
159 4,107,040
198 C 4,107,041
225 4,107,042
232 4,107,043
266 4,107,044
4,107,045
282 4,107,046
337 4,107,047
407 4,107,048
490 4,107,049
492 4,107,050
500 R 4,107,051
534 4,107,052

CLASS 211

71 4,106,629
191 4,106,630

CLASS 212

144 4,106,631

CLASS 214

1 BB 4,106,632
4,106,633
1 D 4,106,634
8.5 A 4,106,635
11 R 4,106,636
13 4,106,637
14 4,106,638
4,106,639
4,106,640
15 R 4,106,641
18 R 4,106,642
83.36 4,106,643
138 C 4,106,644
145 A 4,106,645
147 R 4,106,646
152 4,106,647
341 4,106,655
372 4,106,648
522 4,106,649
750 4,106,650

CLASS 215

221 4,106,651
253 4,106,652
256 4,106,653
329 4,106,654
364 4,106,656

CLASS 219

10.55 B 4,107,501
10.55 F 4,107,502
61 4,107,503
69 E 4,107,504
76.14 4,107,505
85 A 4,107,506
121 P 4,107,507
137.7 4,107,508
211 4,107,509
270 4,107,510
286 4,107,511
343 4,107,512
521 4,107,513
523 4,107,514
541 4,107,515

CLASS 220

23.4 4,106,657
67 4,106,659
90.4 4,106,660
232 4,106,661
268 4,106,662
326 4,106,663
329 4,106,664
4,106,665
373 4,106,666
453 4,106,658

CLASS 221

1 4,106,667
131 4,106,668
217 4,106,669

CLASS 222

20 4,106,670
61 4,106,671
151 4,106,672
207 4,106,673
386.5 4,106,674
556 4,106,675

CLASS 223

106 4,106,676

CLASS 224

5 A 4,106,677
5 D 4,106,678
26 B 4,106,679
29 R 4,106,680
42.12 4,106,681

CLASS 225

103 4,106,682
4,106,683

CLASS 226

91 4,106,684
136 4,106,685
188 4,106,686

CLASS 228

2.5 4,106,687

CLASS 229

39 R 4,106,688

CLASS 233

23 R 4,106,689

CLASS 235

92 FP 4,107,516

CLASS 236

46 R 4,106,690
92 B 4,106,691

CLASS 237

8 R 4,106,692
51 4,106,693

CLASS 238

10 C 4,106,694
10 F 4,106,695
62 4,106,696

CLASS 239

15 4,106,697
34 4,106,698
124 4,106,699
168 4,106,700
271 4,106,701
533.3 4,106,702
656 4,106,703
685 4,106,704

CLASS 241

49 4,106,705
186.2 4,106,706
202 4,106,707
222 4,106,708

CLASS 242

7.03 4,106,709
18 R 4,106,710
19 4,106,711
47.01 4,106,712
4,106,713
54 R 4,106,714
57.1 4,106,715
68.4 4,106,720
75.43 4,106,716
84.2 B 4,106,717
84.2 R 4,106,718
96 4,106,719
107 4,106,721
107.7 4,106,722
118.3 4,106,723
198 4,106,724
201 4,106,725

CLASS 244

3.17 4,106,726
49 4,106,727
83 D 4,106,728
137 P 4,106,729
183 4,106,730
188 4,106,731

CLASS 246

182 B 4,107,253

CLASS 248

100 4,106,733
4,106,734
119 R 4,106,735
222.2 4,106,736
226.4 4,106,737
235 4,106,738
345.1 4,106,739
358 R 4,106,740
467 4,106,741
488 4,106,742

CLASS 249

34 4,106,743
96 4,106,744
97 4,106,745
216 4,106,746

CLASS 250

199 4,107,517
4,107,518
4,107,519
201 4,107,520
203 R 4,107,521
221 4,107,522
223 B 4,107,523
282 4,107,524
303 4,107,525
305 4,107,526
309 4,107,527
317 4,107,528
339 4,107,529
342 4,107,530
360 4,107,531
4,107,532
364 4,107,533
368 4,107,534
406 4,107,535
423 P 4,107,536
4,107,537
480 4,107,538
561 4,107,539
566 4,107,540
571 4,107,541

CLASS 251

84 4,106,747
133 4,106,748
144 4,106,749
282 4,106,750

316 4,106,751

CLASS 252

2 4,107,053
8.55 C 4,107,057
8.6 4,107,055
8.8 4,107,056
18 4,107,058
28 4,107,059
33.4 4,107,054
49.3 4,107,060
4,107,061
62.1 P 4,107,062
62.52 4,107,063
89 R 4,107,064
99 4,107,065
132 4,107,066
135 4,107,067
182 4,107,068
4,107,069
301.4 S 4,107,070
316 4,107,071
4,107,072
321 4,107,073
359 E 4,107,075
373 4,107,076
408 4,107,077
428 4,107,078
429 R 4,107,079
431 C 4,107,080
431 L 4,107,081
431 R 4,107,082
439 4,107,083
445 4,107,084
448 4,107,085
455 R 4,107,087
455 Z 4,107,086
4,107,088
465 4,107,089
4,107,090
466 J 4,107,091
511 4,107,092
521 Re.29,731
522 4,107,093
4,107,094
541 4,107,095
546 4,107,096

CLASS 254

29 A 4,106,752
157 4,106,753
186 HC 4,106,754

CLASS 260

4 R 4,107,109
17.4 CL 4,107,110
17.5 4,107,111
18 EP 4,107,112
18 PF 4,107,113
22 CB 4,107,114
23 EP 4,107,116
23 XA 4,107,115
28.5 B 4,107,117
29.2 EP 4,107,118
29.4 UA 4,107,119
29.6 AB 4,107,121
29.6 RB 4,107,120
30.2 4,107,122
31.8 G 4,107,123
33.6 AQ 4,107,124
37 N 4,107,125
38 4,107,126
4,107,127
40 P 4,107,129
40 R 4,107,128
4,107,130
40 TN 4,107,131
42.14 4,107,132
42.15 4,107,133
42.17 4,107,134
42.18 4,107,194
42.37 4,107,135
45.7 P 4,107,138
45.8 NZ 4,107,139
45.85 T 4,107,137
45.95 C 4,107,136
112 B 4,107,157
112.5 R Re.29,732
4,107,158
239 BD 4,107,159
239.3 A 4,107,160
239.55 D 4,107,161
288 CE 4,107,165
294.8 C 4,107,166
295 R 4,107,167
302 E 4,107,168
304 P 4,107,169
306.7 T 4,107,170
306.8 D 4,107,377
307 FA 4,107,171
308 D 4,107,172
308 R 4,107,173
326 NS 4,107,174
326.29 4,107,187
326.5 B 4,107,074
327 M 4,107,175
4,107,176
332.2 A 4,107,178
4,107,179
332.2 C 4,107,177
338 4,107,180
340.9 R 4,107,181
343.21 4,107,182
345.8 R 4,107,183
347.2 4,107,184
348.55 4,107,185
351 4,107,186
397.1 4,107,188
404 4,107,189
4,107,190
408 4,107,191
410 4,107,193
410.5 4,107,192
448 C 4,107,195
448.2 N 4,107,196
455 R 4,107,197
464 4,107,198
465 D 4,107,199
465 E 4,107,200
506 4,107,201
4,107,202
518 R 4,107,203
530 N 4,107,204
558 A 4,107,205
562 R 4,107,206
583 R 4,107,207
586 F 4,107,208
586 R 4,107,209
590 C 4,107,211
4,107,212
4,107,213
4,107,214
4,107,215
4,107,216
590 E 4,107,210
615 A 4,107,217
646 4,107,220
652 P 4,107,221
659 A 4,107,222
666 PY 4,107,223
671 R 4,107,224
683 R 4,107,226
683.9 4,107,225
827 4,107,227
836 4,107,228
841 4,107,229
861 4,107,230
873 4,107,231
876 B 4,107,233
876 R 4,107,232
4,107,234
4,107,235
879 4,107,236
880 R 4,107,237
4,107,238
881 4,107,239

CLASS 261

77 4,107,240
79 A 4,107,241

CLASS 264

1 4,107,242
13 4,107,243
30 4,107,244
40.1 4,107,245
40.7 4,107,246
45.9 4,107,247
51 4,107,248
68 4,107,249
118 4,107,250
171 4,107,251
176 F 4,107,252
270 4,107,254
299 4,107,255
310 4,107,256
328 4,107,257
4,107,258
331 4,107,259
349 4,107,260

CLASS 266

44 4,106,755
99 4,106,756
103 4,106,757
158 4,106,758
220 4,106,759
281 4,106,760

CLASS 269

75 4,106,761

CLASS 270

54 4,106,762

CLASS 271

9 4,106,763
35 4,106,764
93 4,106,765
181 4,106,766
188 4,106,767

CLASS 273

1 M 4,106,768
58 B 4,106,769
80 B 4,106,777
106.5 D 4,106,770
183 B 4,106,771
186 R 4,106,772
240 4,106,773
245 4,106,774

CLASS 274

10 R Re.29,730
15 R 4,106,775
39 R 4,106,776

CLASS 277

9.5 4,106,778
27 4,106,779
81 P 4,106,780
82 4,106,781
235 A 4,106,782

CLASS 279

2 R 4,106,783
4,106,784
4 4,106,785

CLASS 280

8 4,106,786
11.37 E 4,106,787
43.23 4,106,788
166 4,106,790
423 A 4,106,791
432 4,106,792
435 4,106,793
456 R 4,106,794
481 4,106,795
793 4,106,789

CLASS 285

133 R 4,106,796
156 4,106,797
226 4,106,798
365 4,106,799

CLASS 290

40 R 4,107,542

CLASS 292

264 4,106,800
307 R 4,106,801
320 4,106,802

CLASS 293

62 4,106,803
63 4,106,804

CLASS 296

1 A 4,106,805
23 C 4,106,732
23 MC 4,106,806
28 R 4,106,807
35 R 4,106,808
69 4,106,809

CLASS 297

183 4,106,810
193 4,106,811

CLASS 298

1 B 4,106,812
35 M 4,106,813

CLASS 299

2 4,106,814
59 4,106,815

CLASS 301

108 R 4,106,816

CLASS 302

17 4,106,817

CLASS 303

11 4,106,818
38 4,106,819
92 4,106,820
4,106,821

CLASS 305

28 4,106,822

CLASS 307

10 AT 4,107,543
88.3 4,107,544
121 4,107,545
141 4,107,546
203 4,107,547
205 4,107,548
4,107,549
241 4,107,550
252 J 4,107,551
4,107,552
293 4,107,553
306 4,107,554
308 4,107,555
362 4,107,556

CLASS 308

4 A 4,106,823
9 4,106,824
139 4,106,825
172 4,106,192
187 4,106,826
187.1 4,106,827

CLASS 310

11 4,107,557
13 4,107,558
49 R 4,107,559
60 R 4,107,560
95 4,107,561

CLASS 312

107 4,106,828
235 A 4,106,829

CLASS 313

59 4,107,562
60 4,107,563
94 4,107,564
174 4,107,565
293 4,107,566
325 4,107,567
371 4,107,568
402 4,107,569
471 4,107,570
486 4,107,571

CLASS 315

3.5 4,107,573
4,107,574
4,107,575
3.6 4,107,572
169 TV 4,107,576
4,107,577
4,107,578
205 4,107,579
311 4,107,580
324 4,107,581
365 4,107,582

CLASS 318

221 D 4,107,583
227 4,107,584
331 4,107,585
426 4,107,586
439 4,107,587
484 4,107,588
568 4,107,592
602 4,107,589
628 4,107,590
663 4,107,591
685 4,107,593
4,107,594
696 4,107,595

CLASS 323

17 4,107,596

CLASS 324

6 4,107,597
4,107,598
51 4,107,602
61 R 4,107,599
78 R 4,107,600
173 4,107,601
207 4,107,603
208 4,107,604
220 4,107,605
229 4,107,606
253 4,107,607

CLASS 325

4 4,107,608
14 4,107,609
38 R 4,107,610
55 4,107,611
171 4,107,612
348 4,107,613
4,107,614
420 4,107,615

CLASS 328

110 4,107,616
233 4,107,617

CLASS 330

51 4,107,618
255 4,107,619
265 4,107,620
296 4,107,621
302 4,107,622

CLASS 331

1 A 4,107,623
8 4,107,624
37 4,107,625
65 4,107,626
94.5 N 4,107,628
94.5 PE 4,107,627
116 R 4,107,629

CLASS 332

9 T 4,107,630

CLASS 333

17 R 4,107,631
81 A 4,107,632
4,107,633
4,107,634

CLASS 336

45 4,107,635
92 4,107,636
150 4,107,637

CLASS 337

131 4,107,638
205 4,107,639

CLASS 338

23 4,107,640
55 4,107,641
128 4,107,642

CLASS 339

8 R 4,106,830
4,106,831
14 L 4,106,832
29 B 4,106,833
44 M 4,106,834
95 D 4,106,835
97 C 4,106,836
98 4,106,837
99 R 4,106,838
143 R 4,106,839
145 R 4,106,840
176 M 4,106,841
221 R 4,106,842
232 4,106,843

CLASS 340

17 R 4,107,643
18 CM 4,107,644
18 NC Re.29,734
52 E 4,107,645
52 F 4,107,646
71 4,107,647
146.1 AG 4,107,649
146.1 AL 4,107,650
4,107,652
146.1 R 4,107,651
146.3 C 4,107,653
146.3 H 4,107,648
147 MT 4,107,654
149 R 4,107,655
151 4,107,656
324 AD 4,107,662
4,107,663
4,107,664
4,107,665
331 4,107,666
347 AD 4,107,668
4,107,669
347 DA 4,107,670
4,107,671
347 NT 4,107,667
552 4,107,659
566 4,107,660
579 4,107,657
605 4,107,672
620 4,107,658
688 4,107,661

CLASS 343

5 DP 4,107,673
6.5 LC 4,107,675
6.5 R 4,107,674
4,107,676
7 A 4,107,677
7 ED 4,107,678
7.5 4,107,679
4,107,684
8 4,107,680
12 A 4,107,681
16 M 4,107,682
18 E 4,107,683
100 SA 4,107,685
106 R 4,107,686
108 R 4,107,688
112 TC 4,107,689
113 R 4,107,690
120 4,107,691
4,107,692
715 4,107,693
4,107,694
882 4,107,695

CLASS 346

24 4,107,696
33 R 4,107,697
75 4,107,698
4,107,699
76 R 4,107,700
107 R 4,107,687
108 4,107,701

CLASS 350

6.2 4,106,844
6.6 4,106,845
87 4,106,851
96.14 4,106,848
96.24 4,106,849
96.31 4,106,847
4,106,850
117 4,106,852
176 4,106,854
196 4,106,855
199 4,106,856
311 4,106,857
332 4,106,858
333 4,106,853
338 4,106,859
343 4,106,860
354 4,106,861
357 4,106,862

CLASS 352

72 4,106,863
91 C 4,106,864
4,106,865

CLASS 353

29 4,106,866
114 4,106,867

CLASS 354

17 4,107,702
21 4,107,703
23 D 4,107,704
29 4,107,705
31 4,107,706
50 4,107,707
51 4,107,709
60 L 4,107,708
86 4,107,710
112 4,107,711
115 4,107,712
196 4,107,714
206 4,107,715
209 4,107,713
296 4,107,716

CLASS 355

3 R 4,106,869
3 TR 4,106,868
4 4,106,870
99 4,106,871

CLASS 356

4 4,106,872

CLASS 357

3 4,107,718
15 4,107,719
22 4,107,720
30 4,107,721
4,107,722
4,107,723
4,107,724
41 4,107,725
64 4,107,731
71 4,107,726
72 4,107,727
80 4,107,728

CLASS 358

4 4,107,729
10 4,106,846
36 4,107,736
37 4,107,730
43 4,107,732
75 4,107,733
84 4,107,734
4,107,735
93 4,107,737
100 4,107,738
167 4,107,739
293 4,107,740
300 4,107,741
301 4,107,742

CLASS 360

60 4,107,743
73 4,107,744
4,107,745
78 4,107,746
93 4,107,747
104 4,107,748
105 4,107,749
106 4,107,750
122 4,107,751
135 4,107,752
137 4,107,753

CLASS 361

120 4,107,754
220 4,107,755
231 4,107,756
235 4,107,757
275 4,107,758
4,107,759
383 4,107,760
433 4,107,761
4,107,762

CLASS 362

32 4,107,763
35 4,107,764
120 4,107,765
226 4,107,766
236 4,107,767

363	4,107,768
401	Re.29,735
402	4,107,769
405	4,107,770
CLASS 363	
58	4,107,771
124	4,107,772
CLASS 364	
200	4,107,773
	4,107,774
413	4,107,775
431	4,107,717
	4,107,776
465	4,107,777
492	4,107,778
518	4,107,779
521	4,107,780
700	4,107,781
706	4,107,782
746	4,107,783
900	4,107,784
	4,107,785
	4,107,786
CLASS 366	
3	4,107,789
75	4,107,787
81	4,107,788
127	4,107,790
205	4,107,791
302	4,107,792
312	4,107,793
346	4,107,794
CLASS 400	
144.2	4,106,611
470	4,106,873
CLASS 401	
67	4,106,874
CLASS 403	
2	4,106,875
4	4,106,876
14	4,106,877
28	4,106,878
CLASS 404	
10	4,106,879
CLASS 408	
1 R	4,106,880
CLASS 417	
363	4,106,881
517	4,106,882
CLASS 418	
61 B	4,106,883
CLASS 423	
22	4,107,261
32	4,107,262
81	4,107,264
101	4,107,265
112	4,107,266
138	4,107,267
210	4,107,268
222	4,107,269
226	4,107,270
235	4,107,271
239	4,107,272
263	4,107,163
	4,107,273
268	4,107,274
276	4,107,275
290	4,107,276
359	4,107,277
376	4,107,278
389	4,107,279
481	4,107,263
502	4,107,280
625	4,107,281
657	4,107,282
CLASS 424	
1	4,107,283
	4,107,284
	4,107,285
5	4,107,286
8	4,107,287
22	4,107,288
45	4,107,289
47	4,107,290
48	4,107,291
78	4,107,292
84	4,107,293
93	4,107,294
120	4,107,295
121	4,107,296
122	4,107,297
177	4,107,298
182	4,107,299
200	4,107,300
	4,107,301
	4,107,302
244	4,107,303
246	4,107,304
	4,107,305
248.51	4,107,306
249	4,107,307
	4,107,308
	4,107,309
258	4,107,310
	4,107,311
263	4,107,312
	4,107,313
	4,107,314
	4,107,315
266	4,107,316
267	4,107,317
273 R	4,107,318
	4,107,319
274	4,107,320
	4,107,321
278	4,107,322
279	4,107,323
300	4,107,324
301	4,107,325
304	4,107,326
316	4,107,328
317	4,107,329
	4,107,330
319	4,107,331
321	4,107,332
365	4,107,333
CLASS 425	
345	4,106,884
450.1	4,106,885
526	4,106,886
549	4,106,887
577	4,106,888
CLASS 426	
7	4,107,334
96	4,107,335
250	4,107,336
266	4,107,337
293	4,107,338
387	4,107,339
481	4,107,340
504	4,107,341
535	4,107,342
564	4,107,343
625	4,107,344
637	4,107,345
648	4,107,346
660	4,107,347
CLASS 427	
2	4,107,348
36	4,107,349
38	4,107,350
43	4,107,351
50	4,107,352
54	4,107,353
118	4,107,354
120	4,107,355
195	4,107,356
300	4,107,357
379	4,107,358
388 R	4,107,359
389	4,107,360
CLASS 428	
17	4,107,361
35	4,107,362
109	4,107,363
196	4,107,364
202	4,107,365
215	4,107,366
234	4,107,367
245	4,107,368
246	4,107,369
247	4,107,370
255	4,107,371
256	4,107,372
264	4,107,373
288	4,107,374
291	4,107,375
304	4,107,327
306	4,107,376
323	4,107,378
326	4,107,379
327	4,107,380
365	4,107,381
368	4,107,382
379	4,107,383
398	4,107,384
412	4,107,385
	4,107,386
426	4,107,387
428	4,107,388
447	4,107,389
	4,107,390
483	4,107,391
547	4,107,392
558	4,107,393
595	4,107,394
CLASS 429	
21	4,107,395
26	4,107,396
27	4,107,397
88	4,107,398
89	4,107,399
98	4,107,400
101	4,107,401
120	4,107,402
174	4,107,403
194	4,107,404
218	4,107,405
	4,107,406
225	4,107,407
CLASS 431	
46	4,106,889
184	4,106,890
208	4,106,891
CLASS 432	
58	4,106,892
77	4,106,893
122	4,106,894
CLASS 521	
25	4,107,098
30	4,107,099
32	4,107,097
80	4,107,105
85	4,107,108
106	4,107,107
137	4,107,100
	4,107,101
154	4,107,140
163	4,107,102
164	4,107,106
171	4,107,104
CLASS 526	
8	4,107,408
65	4,107,409
73	4,107,410
75	4,107,411
91	4,107,156
114	4,107,412
	4,107,413
	4,107,414
	4,107,415
	4,107,416
117	4,107,417
184	4,107,418
212	4,107,144
228	4,107,419
237	4,107,420
CLASS 528	
54	4,107,151
68	4,107,152
72	4,107,103
93	4,107,142
108	4,107,145
129	4,107,141
168	4,107,146
172	4,107,147
176	4,107,143
273	4,107,148
307	4,107,150
309	4,107,149
312	4,107,154
322	4,107,153
373	4,107,155
483	4,107,421
502	4,107,422
CLASS 536	
4	4,107,423
10	4,107,424
56	4,107,426
119	4,107,425
CLASS 542	
427	4,107,427
437	4,107,428
447	4,107,429
471	4,107,430
CLASS 544	
16	4,107,431
21	4,107,432
30	4,107,433
59	4,107,434
97	4,107,435
169	4,107,436
313	4,107,162
376	4,107,437
380	4,107,164
CLASS 548	
353	4,107,438
CLASS 560	
17	4,107,440
55	4,107,439
121	4,107,441
724	4,107,218
CLASS 568	
726	4,107,442
750	4,107,443
807	4,107,444
875	4,107,219

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D2—	184	248,896
	320	248,897
	361	248,898
	383	248,899
	401	248,900
D6—	25	248,901
	29	248,902
	45	248,903
	69	248,904
	78	248,905
	90	248,906
	94	248,907
	116	248,908
	137	248,909
		248,910
	154	248,911
	157	248,912
	158	248,913
	175	248,914
	179	248,915
D7—	15	248,916
	65	248,917
	143	248,918
D8—	1	248,919
	50	248,920
	57	248,921
	82	248,922
	313	248,923
	394	248,924
D9—	117	248,925
	143	248,926
	158	248,927
D10—	91	248,928
	102	248,929
	106	248,930
	125	248,931
		248,932
D11—	81	248,933
	121	248,934
	155	248,935
	157	248,936
D12—	26	248,937
	129	248,938
	154	248,939
	182	248,940
	183	248,941
D13—	7	248,942
	18	248,943
	32	248,944
D14—	13	248,945
	40	248,946
	42	248,947
		248,948
	50	248,949
	59	248,950
	71	248,951
	72	248,952
D15—	26	248,953
	126	248,954
	148	248,955
D16—	23	248,956
	31	248,957
	38	248,958
	42	248,959
D19—	18	248,960
	69	248,961
	76	248,962
		248,963
		248,964
D23—	4	248,965
D24—	3	248,966
	28	248,967
	39	248,968
	54	248,969
D25—	52	248,970
	94	248,971
D27—	14	248,972
D28—	49	248,973
	83	248,974
D31—	22	248,975
	24	248,976
D34—	5 CH	248,984
	5 GB	248,979
	5 L	248,978
		248,982
	5 R	248,980
	5 SS	248,977
		248,981
		248,983
	14 D	248,985
	15 EE	248,986
	15 M	248,987
	15 PP	248,988
	15 R	248,989
D48—	4 B	248,990
	24 A	248,991
D56—	1 A	248,992
	2	248,993
D64—	11 B	248,994
		248,995

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PATENTS

1 :	4,106,218	4,107,323	4,106,325	4,107,457	4,107,444	4,106,228
	4,106,416	4,107,340	4,106,350	4,107,458	11 : 4,106,755	4,106,232
	4,106,900	4,107,361	4,106,359	4,107,459	4,107,524	4,106,245
4 :	4,106,468	4,107,379	4,106,361	4,107,473	4,107,566	4,106,251
	4,106,728	4,107,532	4,106,370	4,107,479	12 : 4,106,124	4,106,252
	4,107,643	4,107,596	4,106,373	4,107,482	4,106,155	4,106,256
6 :	4,106,142	4,107,610	4,106,376	4,107,530	4,106,216	4,106,271
	4,106,150	4,107,618	4,106,391	4,107,546	4,106,222	4,106,292
	4,106,157	4,107,627	4,106,442	4,107,582	4,106,227	4,106,317
	4,106,171	4,107,642	4,106,443	4,107,606	4,106,233	4,106,334
	4,106,181	4,107,662	4,106,445	4,107,619	4,106,250	4,106,336
	4,106,188	4,107,716	4,106,498	4,107,660	4,106,313	4,106,360
	4,106,206	4,107,723	4,106,505	4,107,665	4,106,410	4,106,385
	4,106,243	4,107,744	4,106,540	4,107,670	4,106,411	4,106,392
	4,106,248	4,107,748	4,106,562	4,107,677	4,106,426	4,106,414
	4,106,257	4,107,770	4,106,575	4,107,682	4,106,544	4,106,422
	4,106,281	8 : 4,106,794	4,106,582	4,107,692	4,106,622	4,106,429
	4,106,282	4,107,046	4,106,583	4,107,728	4,106,653	4,106,433
	4,106,335	9 : 4,106,193	4,106,590	4,107,735	4,106,678	4,106,440
	4,106,372	4,106,375	4,106,634	4,107,765	4,106,726	4,106,466
	4,106,386	4,106,483	4,106,654	4,107,783	4,106,746	4,106,487
	4,106,461	4,106,826	4,106,667	08 : 4,106,486	4,106,751	4,106,488
	4,106,539	4,106,856	4,106,671	4,106,651	4,106,855	4,106,493
	4,106,574	4,106,951	4,106,677	4,106,706	4,106,984	4,106,509
	4,106,579	4,107,010	4,106,684	4,107,261	4,107,039	4,106,513
	4,106,628	4,107,239	4,106,704	4,107,474	4,107,126	4,106,633
	4,106,639	4,107,328	4,106,719	4,107,520	4,107,132	4,106,675
	4,106,679	4,107,377	4,106,731	4,107,651	4,107,348	4,106,702
	4,106,686	4,107,400	4,106,766	09 : 4,106,210	4,107,420	4,106,733
	4,106,717	4,107,471	4,106,790	4,106,235	4,107,509	4,106,734
	4,106,721	4,107,497	4,106,814	4,106,374	4,107,607	4,106,795
	4,106,744	01 : 4,106,441	4,106,875	4,106,432	4,107,611	4,106,808
	4,106,769	4,106,727	4,106,889	4,106,490	4,107,676	4,106,818
	4,106,784	04 : 4,106,220	4,106,906	4,106,599	4,107,695	4,106,830
	4,106,793	4,106,502	4,106,976	4,106,673	13 : 4,106,319	4,106,834
	4,106,806	4,106,552	4,106,995	4,106,674	4,106,662	4,106,837
	4,106,812	4,106,620	4,106,999	4,106,978	4,106,896	4,106,841
	4,106,816	4,106,953	4,107,017	4,107,026	4,106,901	4,106,920
	4,106,833	4,107,671	4,107,031	4,107,041	4,107,043	4,106,921
	4,106,839	05 : 4,107,694	4,107,045	4,107,234	4,107,260	4,107,016
	4,106,844	06 : Re.29,733	4,107,047	4,107,334	4,107,371	4,107,030
	4,106,853	4,106,136	4,107,075	4,107,430	15 : 4,106,504	4,107,073
	4,106,871	4,106,158	4,107,127	4,107,466	17 : Re.29,732	4,107,078
	4,106,958	4,106,201	4,107,145	4,107,562	4,106,125	4,107,083
	4,106,972	4,106,202	4,107,284	10 : 4,106,535	4,106,133	4,107,086
	4,107,054	4,106,207	4,107,332	4,106,693	4,106,164	4,107,087
	4,107,140	4,106,231	4,107,336	4,106,971	4,106,169	4,107,092
	4,107,154	4,106,249	4,107,346	4,107,109	4,106,183	4,107,122
	4,107,181	4,106,263	4,107,350	4,107,125	4,106,197	4,107,171
	4,107,275	4,106,295	4,107,401	4,107,163	4,106,212	4,107,172
	4,107,277	4,106,296	4,107,419	4,107,278	4,106,215	4,107,205
	4,107,282	4,106,300	4,107,455	4,107,303	4,106,221	4,107,250
	4,107,294	4,106,301	4,107,456	4,107,325	4,106,224	4,107,257

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4,107,292
4,107,342
4,107,393
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48 :	Re.29,734		4,106,797		4,107,597	51 :	4,106,330		4,107,280		4,106,272
	4,106,139		4,106,823		4,107,598		4,106,489		4,107,372		4,106,290
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	4,106,304		4,107,096		4,107,667		4,106,687		4,107,734		4,106,676
	4,106,332		4,107,124		4,107,684		4,107,341	54 :	4,106,178		4,106,707
	4,106,412		4,107,130		4,107,697		4,107,512		4,106,786		4,106,828
	4,106,469		4,107,131		4,107,732		4,107,575		4,107,106		4,106,974
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	4,106,564		4,107,230		4,107,781		4,106,226	55 :	4,106,189		4,107,402
	4,106,565		4,107,233		4,107,782		4,106,345		4,106,262		4,107,428
	4,106,581		4,107,363	49 :	4,106,621		4,106,729		4,106,265		4,107,590
	4,106,609		4,107,469		4,107,028		4,106,730		4,106,269	56 :	4,106,328
	4,106,779		4,107,573		4,107,624		4,106,754				

DESIGN PATENTS

6 :	248,977		248,992	25 :	248,983	31 :	248,940		248,964		248,969
8 :	248,910		248,993	26 :	248,955	32 :	248,947		248,965	47 :	248,967
04 :	248,937	09 :	248,897		248,978	33 :	248,909		248,976		248,987
06 :	248,901		248,922		248,990	34 :	248,911		248,984	48 :	248,946
	248,902		248,930	27 :	248,928		248,921		248,989	51 :	248,916
	248,904	12 :	248,906		248,934		248,926	41 :	248,915		248,943
	248,907		248,991		248,935		248,962		248,919		248,975
	248,929	13 :	248,968		248,960		248,963	42 :	248,898	53 :	248,912
	248,948	17 :	248,949		248,961		248,980		248,900		248,942
	248,954		248,956	29 :	248,908		248,981		248,971		248,970
	248,958		248,979		248,914	36 :	248,896	44 :	248,925	54 :	248,972
	248,982	18 :	248,903		248,945		248,933	45 :	248,936	55 :	248,950
	248,988										

PLANT PATENTS

24 :	4,291	4,292	4,293	4,294	

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